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STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

VARIETY OF FINISHES FOR A MULTITUDE OF USES

Thomastrip has proved its distinct advantages and has solved many a production problem. In addition to natural bright finish, Thomas cold rolled strip is available in electro coated finishes—copper, brass, zinc, and nickel. Thomas executive, sales, and engineering departments are all located at the mill. This concentration of control is ready to serve you efficiently at every step. Send for samples, specifying finish, gauge, and temper.

THE Thomastrip Cold Rolled Strip Steel

ZINC COATED COPPER COATED BRASS COATED
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THOMAS STEEL COMPANY • Warren, Ohio •

PROGRESS

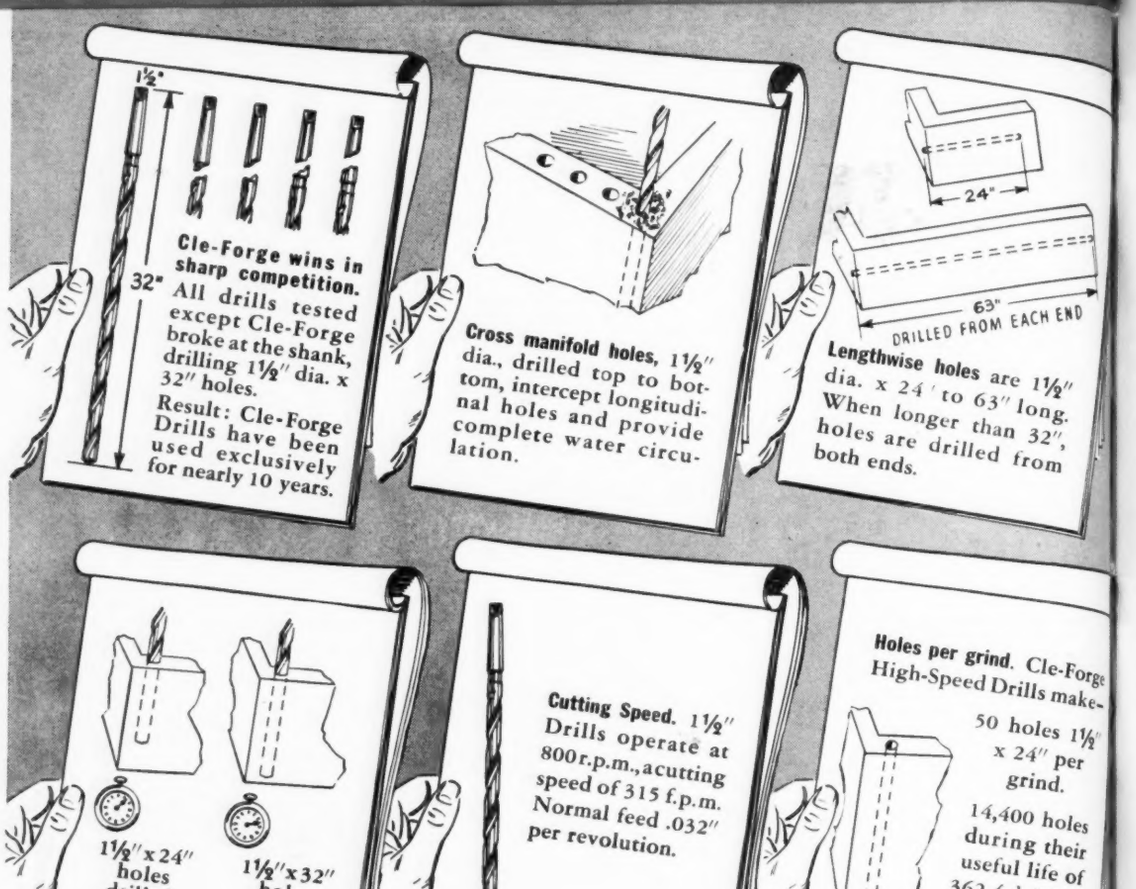
IN MANUFACTURING DRILLS AND REAMERS

Large metal refining company uses vertical molds open at top and bottom for casting copper into cakes and billets preliminary to producing bars and sheets.

The molds themselves are also of pure electrolytic copper, with 4-inch walls. During casting, each mold is kept cool by means of continuous streams of water, circulating rapidly within its four walls.

The water-passages are produced with Cle-Forge High-Speed Twist Drills exclusively—and their excellent performance has not only greatly simplified this unique drilling operation but has greatly reduced costs.

The facts outlined in this advertisement are based upon an impartial survey made by a firm of independent engineers. For complete details of this Performance, ask us to send you Survey No. 91.


1½"
32"
Cle-Forge wins in sharp competition. All drills tested except Cle-Forge broke at the shank, drilling 1½" dia. x 32" holes.
Result: Cle-Forge Drills have been used exclusively for nearly 10 years.
Cross manifold holes, 1½" dia., drilled top to bottom, intercept longitudinal holes and provide complete water circulation.
24"
63"
DRILLED FROM EACH END
Lengthwise holes are 1½" dia. x 24" to 63" long. When longer than 32", holes are drilled from both ends.
1½" x 24" holes drilled in 1.51 minutes each.
1½" x 32" holes drilled in 2.01 minutes each.
Including time for removing chips.
Cutting Speed. 1½" Drills operate at 800 r.p.m., a cutting speed of 315 f.p.m. Normal feed .032" per revolution.
Holes per grind. Cle-Forge High-Speed Drills make—
50 holes 1½" x 24" per grind.
14,400 holes during their useful life of 362.4 drilling hours.
Regrindings. Each regrind of Cle-Forge High Speed Drill removes 1/32" from original 16" flute length.
Drills can be used until flutes are under 7".
Thus each drill can be reground 288 times during useful life.
Cost per drill complete, including one diameter grinding . . . $49.85
Cost for drills, per 100 average holes . . 0.347
Cost for drills, per 100 cu. in. of material removed . . . 0.00817
98 tons per drill. Each Cle-Forge Drill removes 98.2 tons or 356 cu. ft. of solid copper during its useful life. 28.1 cu. in. are cut away, each minute of drilling.

The CLEVELAND TWIST DRILL COMPANY
1242 EAST 49th STREET
CLEVELAND

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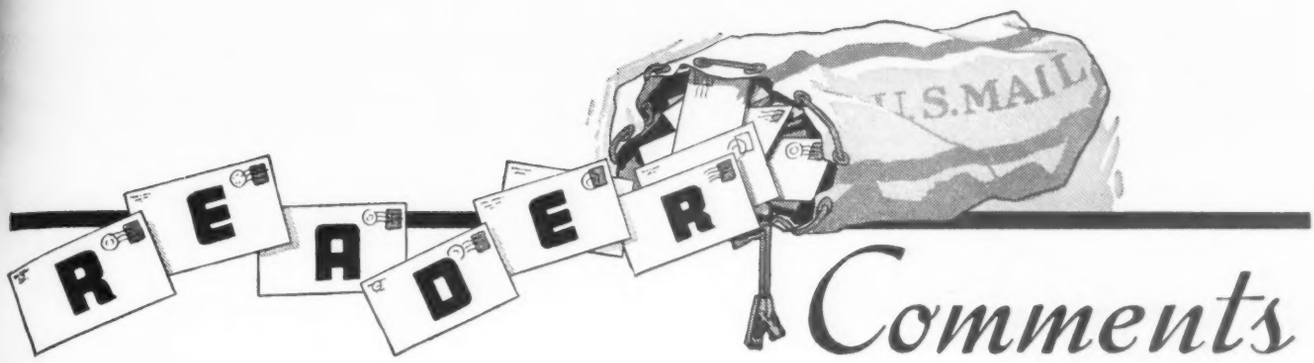


Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

Preparing a Scapegoat

To the Editor:

It begins to appear that the administration is preparing to make "monopoly" the scapegoat for the failure of the spending spree about to be launched. This leads one to believe that Washington has at least learned to expect failure and to be forewarned.

The avowed object of the monopoly hunt is, of course, to cause industry to become thoroughly frightened and as a result to bring prices down while at the same time maintaining wages, thus to reach a level of commodity costs and purchaser income which will insure abundant buying on the part of the public.

Facts and figures collected by departments of the executive branch of the government are ignored, for these figures would expose the complete fallacy of such a program. The administration should and probably does know this.

The writer knows of the conditions existing in one of the major industries where data are collected from practically all its units, which range in capital resources from less than $200,000 to more than $10,000,000 each. The past two years, which were exceptionally good, show an average profit of about 8 per cent. Some of the companies involved were working at a loss.

This is for a period which is the most prosperous since 1929. The average profit per year for these eight years of operation would be much less and probably less than 4 per cent.

As far as the industry mentioned is concerned, it proves two things:

First: That the returns are modest.

Second: That the want of uniformity, operations being from in some cases at a loss, to in one case a profit of 15 per cent, indicates a lack of collusion, at least a lack of effective collusion.

Neither of these conclusions is consistent with the cry of monopoly.

There are many lines of industry where the margin is less than in the one indicated and but few of the major industries where the margin is as generous.

It would seem to be about time that the people at large woke up to the colossal sham of this administration. It is also time that the honest men who are the backbone of the party in power realize that industry will never be able to have any confidence in one who openly glories in its "hatred" and whose utterances are governed by the mouthings of whatever one of his advisers last saw him.

J. H. H.

Cleveland

Elephants Have Rhythm

To the Editor:

The zebras, camels, a baby yak and a llama will probably just chalk it off as a bad week-end and forget about it. But if what they say of elephants is true the carpenters, fitters, welders, and especially the riveters, in a doubled-up car repair crew at the Bethlehem Steel Co.'s car shops at Johnstown, Pa., had better be careful if and when they feed peanuts to the elephants in Robbins Bros. circus next time it visits Johnstown.

It was like this. While enroute to Johnstown for a performance there Saturday, May 14, the Robbins Bros. train was rather badly wrecked at nearby Stoystown. It limped into Johnstown in a downpour of rain, and the scheduled performance there finally had to be canceled. That was tough for lots of folks, but for the animals it was even tougher. The entire end of one of the larger cars was smashed up and the car had to be sent to the Bethlehem car shops for extensive repairs.

So far, so good. But it was raining, and, to the animals, the car they travel in while on circuit is home. Huddled into improvised quarters on a nearby circus lot they were becoming restive. Something had to be done. Their trainers decided the best way out of it would be to put them into their car even though repairs were in progress.

Perhaps for the first time on record an assorted collection of circus animals paraded into a steel plant. The delegation consisted of three camels, two zebras, one baby yak, one llama, and 10 elephants.

The much touted glamor of the places where steel is made and fabricated was all lost on the animals. Welding had to be stopped, riveting had to be stopped; in fact, the repair crew had to cease work altogether before the animals could be brought anywhere near the car.

Once inside their home most of them simply ignored the whole affair. But not the elephants! The riveters reported that every time a rat-a-tat of pneumatic riveters sounded on the steel the elephants got into rhythm and rocked the car, quite violently. They were annoyed!

The riveters and the rest of the crew, too, however, went right ahead and the car rolled out, animals and all, in time to make its next performance on schedule. What the riveters want to know, though, is how good an elephant's memory really is.

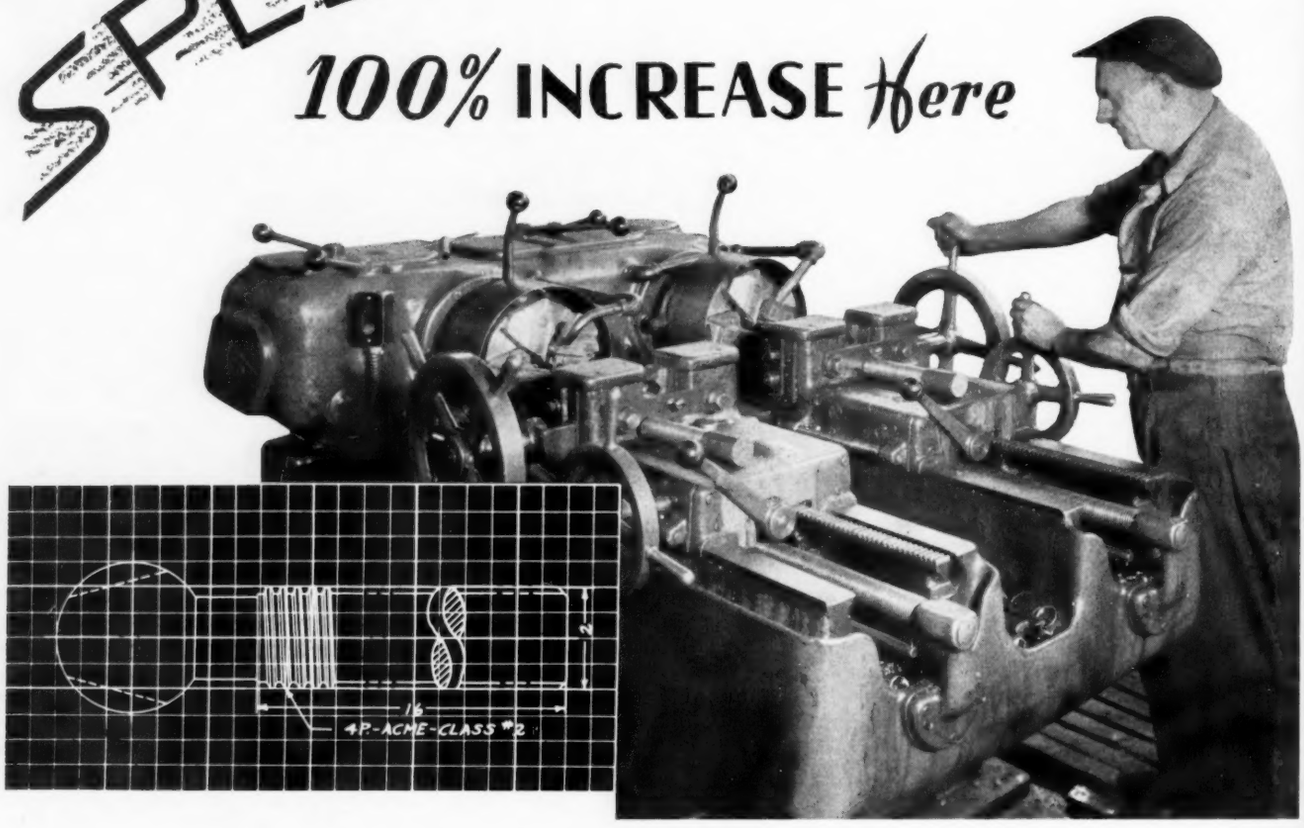
J. C. LONG

Bethlehem Steel Co.,
Bethlehem, Pa.

LANDIS *Equipment for ALL threading operations*

SPEED is PRODUCTION

100% INCREASE *Here*



The Duff Norton Mfg. Company, Pittsburgh, Pa., use *speed* for increasing production 100% when threading ditch brace screws.

They use the *speed* of the new LANDMACO Threading Machine on these 2″ diameter 4 pitch *Acme* threads and they obtain an excellent quality of finish.

They use the fast free cutting action of the LANDIS Patented Tangential Chaser, and have less down time for tool grinding or size adjustment.

They take advantage of the ease with which LANDMACO Machines operate for still more speed.

Why not employ the speed of LANDMACO Threading Machines to solve *your* production problems? Write us.

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STEEL

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

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PRODUCTION · PROCESSING · DISTRIBUTION · USE

Illustrations show some of the latest developments in Morgan Continuous Rolling Mills. Power operated billet skids open up bundles and separate billets before being charged in the 32′ x 50′ furnace. This is of the suspended arch type, gas and oil fired, with recuperator and temperature control. A four strand mechanical billet switch feeds the roughing train.

R40

As the Editor Views the News

■ SOCIAL security taxes loom as an important cost factor in steel production. During the first quarter of 1938 such taxes (p. 17) were paid by the steel industry in the amount of $5,800,000. During this same period the steel industry's aggregate net loss was about $5,000,000. Thus social security taxes meant the difference between operating in the red and making a slight profit. Total security taxes paid by employers to date is about $44,000,000 and by employes $10,900,000. . . . House subcommittee (p. 34) has voted favorably on the bill by which government contracts, loans or grants would be denied to companies which, in the opinion of the national labor relations board are violating the Wagner act. The bill is not expected to become a law at this session.

• • •

Wonder Trains

Two famous trains, New York Central's Twentieth Century Limited and Pennsylvania's Broadway Limited, will glide from terminal berths in refurbished form on June 15 for epochal runs between New York and Chicago. They will maintain 16-hour schedules. Through careful selection of high-strength, light-weight materials, and welded construction, their weight is about one-third less than that of standard equipment. . . . Some 55 to 60 manufacturers so far have availed themselves of the provisions of state and federal fair trade laws calling for maintenance of resale price schedules. Decisions in a number of cases (p. 20) have helped to clarify the positions of both manufacturers and distributors under these laws; in general, these laws have had a stabilizing effect.

• • •

Denotes Confidence

United States Steel Corp.'s $100,000,000 issue of 10-year 3¼ per cent debentures last week found a responsive market (p. 22) and quickly moved to a premium of 2½ points. Between 700 and 800 security dealers participated in the distribution. . . . In Washington last week it was reliably reported (p. 22) the department of justice is to broaden its inquiry into "collusive" bidding and basing point systems. . . . Last week, due to the holiday, steel output dropped 3 points (p. 21) to 25½ per cent of ingot capacity. Next week's rate should be up slightly but no real improvement is expected until Aug. 1. At that time (p. 30) fair tonnages are slated to be distributed by the automobile industry in connection with 1939 model requirements.

• • •

Silicosis Survey

Survey of foundries in New York state reveals only 2.4 per cent of all employes exhibited silicosis. What little hazard exists (p. 40) can be cured by a simple, straightforward attack. . . . First cost plus upkeep does not represent the cost of transmission belts. True measure (p. 42) is the production obtained with such belts. Belts in the steel industry are rated on a tonnage basis. . . . Inwall temperature (p. 55) serves as a guide in blast furnace operation. It measures radial distribution of gas and shows in what direction changes in distribution should be made. These findings are regarded as valuable in indicating how irregularities in furnace operating efficiency may be remedied. . . . Glass insulation in motor windings (p. 68) resists severe operating conditions.

• • •

Mills Improved

Improvement program at continuous hot and cold strip mills of Otis Steel Co. (p. 50) has been completed. Width of mills has been increased to 77 inches. Delivery speed of hot mill has been increased from 1200 to 1600 feet per minute and that of cold mill from 300 to 600 feet. . . . Instead of threading and capping pipe ends in gas stove manifolds, one manufacturer (p. 60) is closing them by a friction welding operation. Special machinery is used and production is fast and cost low. . . . Even costly lacquered articles frequently show iridescence, stains and other defects; such trouble may be avoided in many cases (p. 66) by selecting the right type of lacquer. . . . Savings have been effected at a tractor plant through installation (p. 47) of a modern materials handling system.

E. L. Shaner

Production Costs Cut with Certified Alloy Steels

You can depend on better results in less time when your heat treater is guided by the Ryerson alloy data charts. These charts show him the exact properties of the steel with which he is working and tell him how to get the desired results. He does not have to test. He takes no chances. Spoilage is eliminated and a sound dependable job of high accuracy and uniformity is assured.

In addition to saving in production costs, the Ryerson Certified Alloy plan benefits the Purchasing Department as they can keep a detailed record of the exact analysis of every alloy purchased. Thus it is possible to duplicate particularly desirable close range specifications on repeat orders.

The Metallurgical Department is benefitted too for they can call for any reasonable physical requirement and be sure the Heat Treater can produce the desired result.

Ryerson Certified Steels also include carbon, tool and stainless steels that meet definite quality standards. They offer many advantages to steel users. Let us tell you the complete story. Write for booklet.

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Social Security So Far Costs Steel $44,000,000; Employes, Over $10,900,000

■ SOCIAL SECURITY taxes cost the steel industry approximately $5,800,000 in the first quarter of 1938. Steel's aggregate net loss in that period was about $5,000,000, indicating social security tax costs were the difference between operating in the red and making a slight profit.

In 1937, unemployment compensation and old age pension taxes cost the industry $30,000,000. This, of course, was in addition to the expense of keeping detailed and complicated records and making multiple returns to federal and state governments.

Employes were taxed an additional $9,500,000 for old age pensions and a lesser amount for unemployment compensation in those states requiring contributions by employes.

The total paid by the employers to date is about $44,100,000, and by the employes, $10,900,000, as in the following table:

Year	Unemployment	Old Age Pensions Employer	Employe	Total
1936	$ 9,300,000	.....	.....	$ 9,300,000
1937	20,500,000	$ 9,500,000	$ 9,500,000	39,500,000
1938 (first quarter)	4,400,000	1,400,000	1,400,000	7,200,000
Totals	$34,200,000*	$10,900,000	$10,900,000	$56,000,000

*Includes estimated $1,000,000 paid by employes in states requiring employe contributions.

Social security taxes paid by steel producers in the first quarter of 1938 were equivalent to $1.40 for each gross ton of steel made for sale. In 1937, these taxes on employers were equal to 79 cents per ton.

Total of payments, by both employer and employe, for the first quarter this year amounted to $1.75 for each ton of steel made for sale.

In 1937 the taxes paid by employer and employe amounted to $62.80 for each of the 513,000 wage-earning employes on the payrolls during the year. This is equivalent to a year's pay for more than 25,000, based on the $1570 average annual steel wage. Figures are for unemployment compensation and old age pension taxes only, and do not include other federal, state and local taxes.

In 1937, other federal taxes, including the tax on surplus and excess profits, amounted to $67,500,000, an 85 per cent increase over $36,600,000 in 1936. Miscellaneous state and local taxes amounted to $68,400,000 in 1937, against $59,100,000 in 1936.

Tax May Vary

While unemployment compensation taxes may vary in the several states after 1940, or when merit rating plans become effective, social security costs are expected to increase to about 9 per cent of payrolls by 1949, according to the following schedule:

For Years	Unemployment	Old Age Pensions By employer	By employe	Total
	(Per Cents)			
1936.....	1	0	0	1
1937.....	2	1	1	4
1938.....	3	1	1	5
1939.....	3	1	1	5
1940–42 inc..	3	1½	1½	6
1943–45 inc...	3	2	2	7
1946–48 inc...	3	2½	2½	8
1949.....	3	3	3	9

Assuming that steel payrolls in 1949 equal those of 1937, the total social security tax will be almost $60,000,000 for employers, and almost $30,000,000 for employes.

Although merit rating plans may cause a reduction in unemployment compensation taxes, they may also cause an increase. Steel men generally believe the rate will not fall below 3 per cent on an average. Upward revision is possible.

Over all, there is a heavy though intangible burden in keeping detailed employment and payroll records for each employe and making numerous reports to federal and state governments.

Unemployment compensation acts of the several states, although similar in structure, vary widely in administration, and somewhat in the amount of tax.

Steel companies operating in various states, therefore, must make returns to the federal government and also to the states. This has required large increases in clerical forces.

For example, in one medium-size mill, 500 work hours were required to complete a quarterly unemployment compensation tax return.

Several states are collecting unemployment compensation taxes from employes as well as employers. Generally this is 1 per cent of wages, as in Massachusetts, New Jersey, Kentucky, California and Alabama. Rhode Island takes 1½ per cent, and Louisiana only 0.5 per cent.

Differ in Administration

Practically all state laws conform to the cardinal points suggested by the federal law, though wide differences exist in the administration.

Merit rating plans set up in the state acts provide for varying rates of unemployment compensation tax. Ohio, for example, provides for a

minimum of 1 per cent and a maximum of 4 per cent plus 0.3 per cent for the federal government. Merit rating plans generally will not become effective for several years.

Most states have not yet started payment of unemployment benefits, or have started so recently that the practicability of the plan has not been tested, either for administration or for sufficiency of reserves.

Already, however, some pressure is being exerted to return the unemployment compensation plan to the federal government for administration. Proponents of the change offer only claims of the states' inability to administer the act, present few advantages for administration by the federal government.

Critics of the tax point out that low wages, and consequently low tax collections, go hand in hand with high rates of unemployment. For this reason, they say, the years when collections are smallest will be those years when the number of unemployed eligible for benefits is greatest. Unless adequate reserves can be built up in prosperous years to tide over years of depression, the plan will be inadequate to meet the needs of the unemployed.

They believe it is doubtful under present rates if funds could be accumulated in each state in prosperous times sufficient for a severe depression, without additional grants by the government.

Many flaws have been uncovered in the present set-up and agitation for changes or abandonment of parts or all of the program is constant. This uncertainty has not endeared the tax to support the program to either employer or employe.

Reflecting the uncertainty is a recent statement by Westinghouse Electric & Mfg. Co. which reaffirmed its readiness to supplement the fedral program with a private annuity program—as soon as the government's plan has been stabilized.

"That the program had not matured during 1937 is due only to uncertainty and the probability of change that surrounds present governmental enactments."

"Modernity Translated Into Steel" In New Fleets of Famous Trains

■ TWO FAMOUS trains, the New York Central's Twentieth Century Limited and the Pennsylvania's Broadway Limited, will glide from terminal berths June 15 for epoch-making runs between New York and Chicago.

Brand new equipment, these trains will incorporate the latest luxury, comfort and safety features. They will maintain 16-hour schedules, a reduction of 30 minutes in present running time.

"Modernity translated into steel!" This is the New York Central's summation of its new equipment. Steel has contributed greatly to this latest achievement in railroad transportation. High tensile alloy steel (all-welded construction) has been used throughout the main structural portions of the cars. Special steels also meet exacting requirements for locomotives. Aluminum alloys have been used extensively for such parts as floor supports, partitions and interior trim.

By use of these metals the New York Central has reduced weight of trains approximately one-third, without loss of strength or safety. A section of 13 cars and the locomotive will weigh approximately 1070 tons, and, incidentally, will be 1194 feet long. The Pennsylvania's equipment is similarly constructed.

Trains comprise veritable fleets and sections will leave New York and Chicago on the same day. They will be the first all-room trains in America, with Pullmans including varying groups of roomettes, bedrooms, compartments and drawing rooms. All cars were built by Pullman except two Pennsylvania diners which were built by Edward G. Budd Mfg. Co.

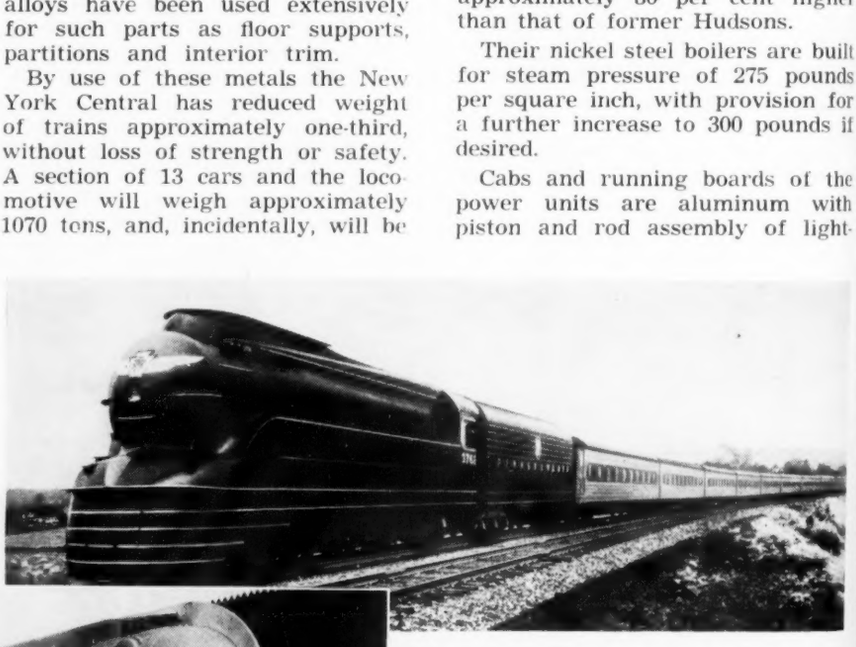
13 Cars to Section

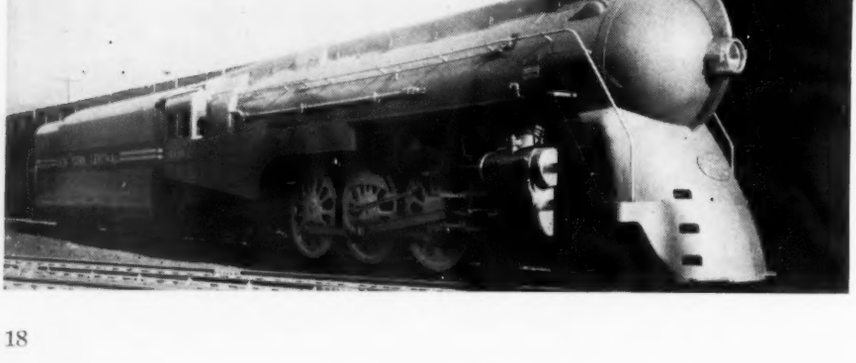
The New York Central's sections, which differ only slightly from the Pennsylvania's, will be made up of 13 cars: One mail-baggage car; one lounge; two roomette cars, with 17 roomettes each; one with ten roomettes and five double bedrooms, one car with four double bedrooms, four compartments and two drawing rooms; two dining cars; one car with four double bedrooms, four compartments and two drawing rooms; one with ten roomettes and five double bedrooms; one with 13 double bedrooms; one of four double bedrooms, four compartments and two drawing rooms; and one observation car.

New Hudson type locomotives will be used, having 4700 cylinder horsepower at a speed of 75 miles per hour and capable of exerting a drawbar pull at 80 miles per hour approximately 30 per cent higher than that of former Hudsons.

Their nickel steel boilers are built for steam pressure of 275 pounds per square inch, with provision for a further increase to 300 pounds if desired.

Cabs and running boards of the power units are aluminum with piston and rod assembly of light-





■ **Streamlined steam locomotives will lead the way when two major roads inaugurate an improved rail transportation service between New York and Chicago June 15. At top is the Pennsylvania's new Broadway Limited, an all-room train. At left is a locomotive of the type which will head the New York Central's new Twentieth Century Limited**

weight alloy steel. All axles on both engines and tenders, as well as crossheads, are equipped with roller bearings. Five of the ten streamlined locomotives which will comprise the New York Central fleet have roller-bearing driving rods and valve gears.

The locomotive is streamlined by use of a metal hood with a satin-finished aluminum fin curving around the spherical front of the boiler. Driving wheels are painted with aluminum.

From locomotive to observation car the exterior is in two tones of gray, with blue and silver stripes. While the cars are not articulated, they have full width closures at the ends which produce a flush exterior surface, carrying out the full streamlined effect. Curving of skirts below the car bodies, which conceal the lighting, heating and air-conditioning machinery, further enhance the streamlined effect.

Eliminates Shocks

Use of tightlock couplers and "twin cushion" draft gears eliminates all slack and provides continuous cushioned connection between cars thus doing away with all longitudinal shocks in starting and stopping, or while operating at various speeds. All axles run on roller bearings. Truck frames, center casting and spring plank are nickel steel. The bolster springs are chrome vanadium and the equalizer springs are silicon vanadium. The trucks weigh 1800 pounds per car set. Henry Dreyfuss, industrial designer, co-operated with the New York Central in the design and decoration of the new Century, and contributed to many new features.

The lounge, observation car and dining cars are all novel in their conception and formal arrangement. An observation car feature is an especially large deluxe suite, consisting of drawing room and bedroom which may be thrown into one by means of a folding wall.

Each room contains lounging and toilet facilities, with a shower in the drawing room. In this car a speedometer and odometer provides information as to speed and distance covered.

The lounge bar has a fully equipped service bar with display shelves of a new and clear plastic material simulating glass. An octagonal barber shop is an innovation. Copper trim is used in the lounge car.

Each dining car has a main dining section with a smaller room at each end, divided from the main section by a new crystal-clear shatterproof plastic. Kitchen and pantry also are incorporated at one end. In the kitchen stainless steel is used for facing the low cabinets while

(*Please turn to Page* 88)

Industry's Experience with New Fair Trade Laws

By GEORGE A. FERNLEY
Secretary-Treasurer, National Association of Sheet Metal Distributors

■ PRIOR to last August the manufacturer had certain prescribed rights and he still has these rights. He can:

(a) Select his own customers. There is no law requiring the manufacturer to sell to anyone to whom he does not wish to sell.

His position was and is like that of any individual. If you own a lot adjoining your home, there is no law which would compel you to sell it to an objectionable party.

(b) The manufacturer has the right to establish and announce the conditions under which his products are to be distributed including the price at which goods must be resold.

If the buyer does not adhere to these suggested prices, then the manufacturer has the right to refuse to sell to him because he has not respected the wishes of the seller.

A high degree of stability was brought about in the wholesale business through the exercise of these legal rights by manufacturers. However, the manufacturer's rights were materially enlarged when the Miller-Tydings act became effective Aug. 17, 1937.

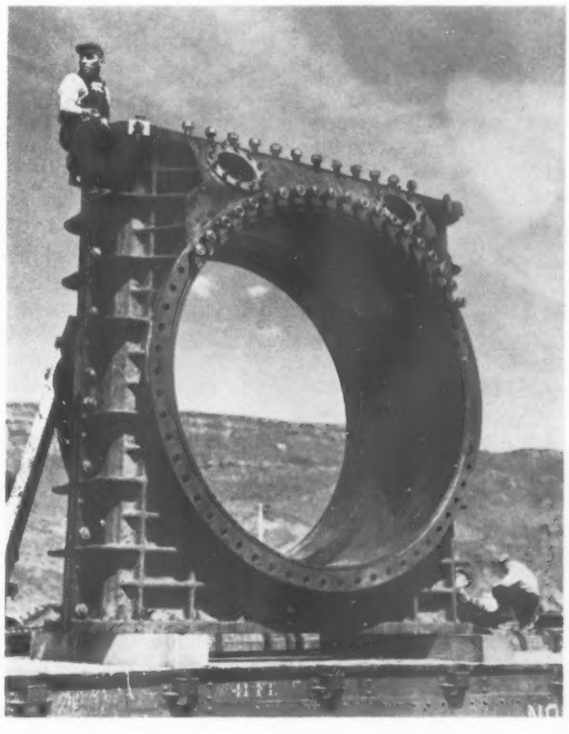
It put the stamp of approval of the federal government upon the state fair trade laws which provide that a manufacturer of trade-marked or branded products may enter into legal contracts with distributors binding them to observe minimum resale prices set by the manufacturer.

These contracts are enforceable in the courts. Moreover, where a manufacturer has entered into a contract with one distributor in a state all other distributors upon being given notice must adhere to the terms of the contract. This highly important provision has been sustained by the Supreme Court.

Forty-three states have enacted fair trade laws, that is, all except Alabama, Delaware, Missouri, Vermont, Texas, and the District of Columbia. Contracts are not prohibited in Delaware and Vermont, but noncontracting dealers are not compelled to abide by the resale prices.

Contracts for price maintenance may be extremely simple. There is no need for complicated forms. Likewise the same form can be used in each one of the 43 states having fair trade laws.

To date some 55 or 60 manufac-



■ **Gate-frame section of ring-follower gate built by Hardie-Tynes Mfg. Co., Birmingham, Ala., for the Grand Coulee dam. The government's order called for 20 ring-follower gates and 20 "paradox" gates, all heavy types of equipment, now nearing completion**

turers have taken advantage of the provisions of the state and federal fair trade laws, but the passage of this legislation has had a very helpful effect in the maintenance of resale schedules.

You may inquire why our manufacturing friends, many of whom for years have been urging price maintenance and advocating legislation similar to the Miller-Tydings act, are not taking advantage of this opportunity. So far as I have been able to ascertain the reasons are as follows:

(a) They wish someone else to do the pioneering and experimenting.

(b) They are of the opinion that it is tremendously expensive, cumbersome and unwieldly to enter into contracts with distributors in 43 states.

(c) They are fearful that it will place them in an unfavorable competitive situation.

(d) Distributors generally have not as yet indicated that they want such contracts executed.

There have been a sufficient number of court cases to indicate that price agreements are enforceable. The most important was the decision of the Supreme Court validating the California and Illinois laws.

Since then there have been several additional court decisions of interest. For example, the appellate court in Brooklyn upheld the right of one distributor to sue another under the New York law. It declared the act protects not only trade-mark owners but distributors and the public, and a distributor could bring suit against another distributor because the act states "price cutting is unfair competition and is actionable at the suit of any person damaged thereby."

Is a manufacturer who establishes minimum prices at which wholesalers may sell to retailers bound by this price himself?

Yes. In Gillette Safety Razor Co. v. Green, the New York supreme court denied relief to the manufacturer who was seeking to enforce resale price contracts against wholesalers because the manufacturer was engaged in unfair competition with the wholesalers by granting larger discounts to retailers than wholesalers were permitted to extend.

The court said: "This (the extra discount) is a distinct trade advantage and effectually bars the wholesaler from this attractive and profitable market."

May gifts or concessions be made in connection with the sale of goods under resale price agreements?

No. It has been held by the Pennsylvania court of common pleas, "where the products of the manufacturer are sold at the minimum resale price and in addition profit-sharing coupons (acceptable for articles of value or money) are issued with the product, such coupons being a discount, the transaction is in violation of the fair trade act." (Bristol-Myers Co. v. Nevins Drug Co.)

Is a single price-fixing contract between the producer and one customer sufficient to force all other dealers in the state to abide by the minimum price set by such contract?

Yes. In Revlon Nail Enamel Corp. v. Charmley Drug Shop, the New Jersey chancery court states, "while most producers make identical price-fixing contracts with a large number of customers, that course is unnecessary. A single valid contract is enough to put the statute into operation."

No Discount to Employes

An interesting side-light in this case is the fact that the defendant is a druggist and the complainant considers it poor policy to deal with this class of trade. The court said: "Complainant's refusal to sell to the defendant is not inequitable."

May a purchaser sell to its employes at a discount, making the net price less than the minimum resale price?

No. In Bristol-Myers Co. v. L. Bamberger & Co., the chancery court of New Jersey held that such a policy "constitutes unfair competition within the intent and meaning of the statute."

Must resale prices fixed for retailers be uniform in any one competitive area?

Yes. The New York county supreme court held in Calvert Distillers Corp. and Seagram Distillers Corp. v. Nussbaum Liquor Store Inc.: "The prices fixed for resale by retailers must be uniform in any one competitive area."

May quantity prices be established under a resale price contract?

Yes. "There should be no unfair discrimination in price to retailers. That does not preclude discounts or fair variations in prices having a general application in the trade, based, for example, on quantities sold or time of payment." (Calvert Distillers Corp. and Seagram Distillers Corp. v. Nussbaum Liquor Store Inc., New York county supreme court.)

May a resale price contract provide a standard of determination for trade-in allowances?

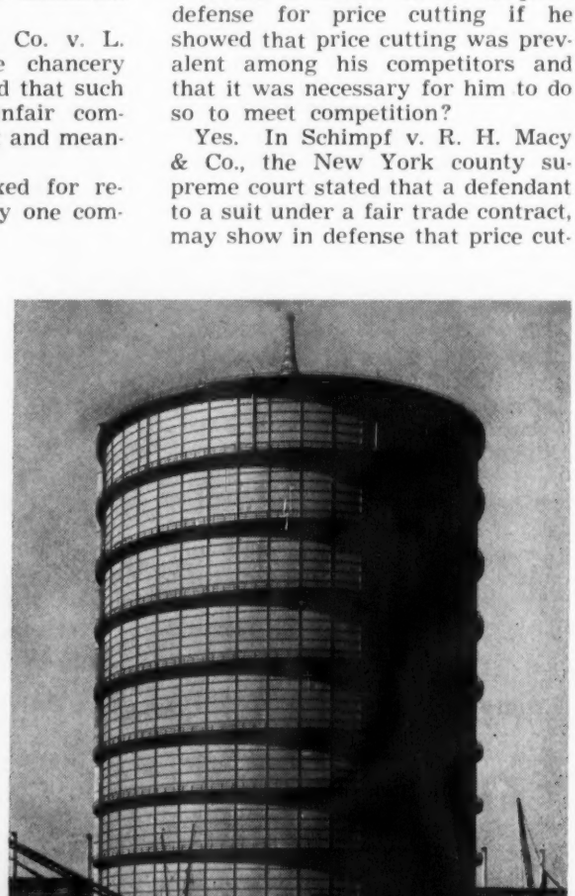
Yes. The New York county supreme court in Schimpf v. R. H. Macy & Co. declared the defense—that provisions of a fair trade contract purporting to establish fixed trade-in standards in the sale of radios are uncertain and indefinite—shall be stricken out on the finding of the court that the provisions are sufficiently definite.

Would a dealer have adequate defense for price cutting if he showed that price cutting was prevalent among his competitors and that it was necessary for him to do so to meet competition?

Yes. In Schimpf v. R. H. Macy & Co., the New York county supreme court stated that a defendant to a suit under a fair trade contract, may show in defense that price cut-

3000 Tons Steel In Gas Holder

■ **Fuel gas from Ford Motor Co.'s new batteries of coke ovens will be stored in this 10,000,000 cubic foot gas holder at Dearborn, Mich. Of all-welded steel construction, it is 218 feet in diameter, 388 feet high, required 3000 tons of steel**



ting was prevalent among his competitors and that it was necessary for him to cut prices to meet competition.

If a dealer purchases goods without notice of established price, is he obligated to observe these prices in selling from this stock?

No. The chancery court of New Jersey in Lentheric Inc. v. Weissbard Bros., and the New York county supreme court in Oneida Ltd. v. Macher Watch Co. Inc., both refused preliminary injunctions with respect to products acquired by retailers prior to notification regarding resale prices.

Do minimum resale prices set by fair trade contracts apply to sales to federal, state and local governments and agencies?

North Carolina is the only state exempting government agencies and, therefore, minimum resale prices apparently apply unless specifically exempt by contract.

PRODUCTION

■ SHARP contraction in active capacity at Pittsburgh and Chicago, with slight changes at other centers caused a loss of 3 points in the national operating rate last week, to 25.5 per cent.

Cleveland—Addition of two open hearths by Otis Steel Co. brought a gain of 5 points to 31 per cent, with the same rate scheduled for this week.

Youngstown, O.—Off 6 points to 21 per cent, with 23 open hearths and one bessemer converter in operation. Schedules for this week indicate a rise to 23 or 24 per cent of capacity, as a bessemer unit will be put in operation by Republic and Sheet & Tube may add an open hearth.

Cincinnati — Declined 6 points to 22 per cent. One producer has put out all open hearths for 30 days, but will continue rolling from ingot stock.

St. Louis — Rose 6 points to 39.3 per cent, one producer lighting two open hearths after being down several weeks.

Pittsburgh — Continued downward revisions reduced the rate 4 points to 18 per cent.

Wheeling — Declined 3 points to 38 per cent.

Birmingham, Ala. — Unchanged at 69 per cent, with 13 open hearths melting.

New England — Down 3 points to 27 per cent. A lower rate is indicated for this week when another producer will withdraw all open hearths.

Central eastern seaboard — Off 1 point to 26 per cent. Further decline is expected this week when a leading platemaker may take off one or two of five open hearths.

Buffalo — Unchanged at 21 per cent. One blast burnace was banked last week.

Chicago — Dropped 6.5 points to 22.5 per cent, the lowest rate this year and on a par with the fourth week of December.

Detroit — Steady at 18 per cent. Operations have held at this rate since the beginning of April.

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended June 4	Change	Same week 1937	Same week 1936
Pittsburgh	18	— 4	95	62
Chicago	22.5	— 6.5	63	70
Eastern Pa.	26	— 1	71	43
Youngstown	21	— 6	29	77
Wheeling	38	— 3	96	68
Cleveland	31	+ 5	46	82
Buffalo	21	None	88	84
Birmingham	69	None	83	69
New England	27	— 3	45	70
Cincinnati	22	— 6	96	80
St. Louis	39.3	+ 6	91	†
Detroit	18	None	100	88
Average	25.5	— 3	75	67

†Not reported.

Auto Output Off 18,140

■ Automobile production declined 18,140 units last week to 26,980, a new low for the 1938 model season. Assemblies in the corresponding week of 1937 totaled 101,779. Comparisons, according to *Ward's Reports:*

	Week ended June 4	May 28
General Motors	15,650	20,300
Chrysler	5,475	7,000
Ford	2,000	12,760
All others	3,855	5,060

Monthly and yearly comparisons will be found on page 30.

■ Northwest Chapter of the Institute of Scrap Iron and Steel Inc. has been formed, with headquarters at Minneapolis. It includes Minnesota, Iowa, North and South Dakota. Sol H. Rosen, Union Scrap Iron & Metal Co., Minneapolis, is president.

Stainless Steel Output Increases

■ PRODUCTION of stainless steel ingots in 1937 amounted to 139,838 gross tons, an increase of 48,872 tons, or 53.7 per cent over 90,966 tons in 1936. These figures are presented in the American Iron and Steel institute's twenty-sixth annual statistical report, just issued.

The report carries forward the usual series of statistics. Included in these are production of stainless steel ingots by analysis, and production of hot-rolled alloy steel products, including stainless, both initiated in 1934.

As shown in the accompanying table, production of stainless ingots was the highest of the four-year period for which statistics are available. Comparing 1937 with 1936, largest tonnage increase was made in 18-8 chromium-nickel ingots with 20,011 tons, or 51.2 per cent. The 12-14 per cent chromium group increased 6704 tons, or 28.4 per cent; the 16-18 per cent chromium group 3310 tons, or 15.5 per cent; and all other, 18,847 tons, or 270 per cent.

Figures on 1937 production of hot-rolled alloy steel products, including stainless, in gross tons, follow:

	Alloy other than stainless	Stainless	Total
Plates	55,120	4,366	59,486
Sheets	201,285	23,410	224,695
Strip	53,017	19,326	72,343
Bars	909,118	24,625	933,743
Light structural shapes	2,238	106	2,344
Rails	757	.....	757
Skelp and blanks or p'rc'd billets	145,720	1,813	147,533
Wire rods	40,396	6,944	47,340
Blooms and billets for forg'g	127,253	6,733	133,986
All other	50,567	984	51,551
Total	1,585,471	88,307	1,673,778

The summary at the beginning of the statistical report shows that companies representing more than 92 per cent of the capacity of the iron and steel industry had a total investment in 1937 of $4,281,264,890, a slight increase over the $4,153,672,051 for 1936. Earnings on investment were 6.18 per cent in 1937 as against 4.57 per cent in 1936.

Production of Stainless Steel Ingots by Analysis

Gross Tons

Year	18% chromium and 8% nickel	12 to 14% chromium	16 to 18% chromium	All other high chromium or chromium-nickel alloys	Total
1934	19,777	8,902	8,077	13,161	49,917
1935	24,711	13,232	12,837	14,917	65,697
1936	39,107	23,598	21,288	6,973	90,966
1937	59,118	30,302	24,598	25,820	139,838

Britain Checks Steel Imports

■ A GRAPHIC picture of the course of the steel industry in Great Britain over the past year is shown in figures covering production and imports of steel and iron.

In April, 1937, steel and iron imports totaled 88,469 gross tons, a normal volume. Through the remainder of the year there was a steady increase, fostered by reductions in import duties. Imports rose to 308,735 tons in January this year. Demand by this time having decreased, a smaller volume was imported in February and March. However, this was more than needed, when added to domestic production and the British Iron and Steel federation applied full import duties on steel April 1, and restored the 33 1/3 per cent on pig iron May 13, resulting in a drop of imports to 61,469 tons in April.

Need Exceeded Capacity

Heavy requirements last summer were beyond the capacity of British producers, especially in semifinished steel, although an all-time record in ingot output was established in September. In addition, the import duties were held in abeyance to provide admission of foreign steel. The quota of imports from the Continent, as agreed under the steel entente, was enlarged several times.

The effect of this method of regulation is apparent in the figures for steel production in Great Britain. While provision was made for an enlarged supply of semifinished steel, control was exercised to prevent interference with domestic production of ingots.

That resumption of the import duties was well timed is indicated by the fact that production in April was below the average:

	Gross Tons		
	Total Iron and Steel	——Production——	Steel
1937	Imports	Pig Iron	Ingots
April	88,469	680,700	1,080,400
May	98,054	696,300	1,047,300
June	174,824	699,300	1,106,400
July	202,283	729,300	1,059,200
Aug.	213,421	714,000	987,700
Sept.	226,190	726,600	1,163,000
Oct.	220,522	769,600	1,133,600
Nov.	272,501	762,300	1,178,300
Dec.	288,343	783,800	1,103,800
1938			
Jan.	398,735	761,100	1,081,400
Feb.	230,402	693,300	1,057,600
March	276,785	714,600	1,115,800
April	61,469	661,000	938,600

BRITISH IRON PRODUCERS BLOW OUT MORE STACKS

London—(*By Cable*)—Decision by the government not to accumulate pig iron reserves at present is a disappointment to producers in Great Britain. Output of iron exceeds demand and Dorman, Long & Co. Ltd. has blown out four blast furnace stacks.

Markets are dull and semifinished steel mills are curtailing output. Exports have declined.

The Continent reports renewal of the steel entente is delayed by refusal of one Belgian firm to agree to terms. Export trade is quiet and prices are weakening.

LABOR

STEEL'S EMPLOYMENT AND PAYROLLS DECLINE

■ PAYROLLS of the steel industry in April totaled $47,809,000, about 7 per cent below March total of $51,386,000, according to the American Iron and Steel institute. Decline reflected both smaller number of working days in April and lower operations.

A total of 445,000 employes was on the payrolls during April, compared with 455,000 in March.

Between April, 1937, and April, 1938, steel production dropped 62 per cent, while the number employed dropped only 24 per cent, and total payrolls only 49 per cent. In April, 1937, the steel industry employed 589,000 men, paid out $94,322,000 in payrolls.

Wage-earning employes averaged 82.6 cents per hour in April, against 81.8 cents in March. In April, 1937, when the high rate of operations required a substantial amount of overtime work, for which time-and-a-half is paid, wage-earning employes averaged 85 cents per hour.

Hours worked per week by wage earners in April averaged 25.6, compared with 26.7 hours per week in March and 41.3 hours per week in April 1937.

ARMCO "WELCOMES" ELECTION AT ASHLAND

"Entirely unjustified . . . . the aftermath of unsuccessful attempts by the CIO to enlist members in our plants."

This was the comment of C. H. Murray, assistant to the president, American Rolling Mill Co., last week on charges filed by the Steelworkers' Organizing committee with the labor board's regional office, against the company's Ashland, Ky., plant.

"April 22 on request of the CIO, the labor board conducted an election in our Butler, Pa., plant which resulted in defeat for the CIO by nearly 3½ to 1. The major purpose obviously is to outlaw the plan of employe representation which has operated successfully for many years.

"We welcome a thorough investigation. If there is any doubt in the minds of the board or the CIO as to the sentiment of the men in Ashland we suggest that an election be called immediately."

A hearing on the charges has been scheduled by the board June 7 in Catlettsburg, Ky.

FINANCIAL

U. S. STEEL'S DEBENTURES GO TO 2½-POINT PREMIUM

■ UNITED STATES STEEL CORP'S $100,000,000 issue of 10-year 3¼ per cent debentures last week found a responsive market and quickly moved to a premium of 2½ points. Between 700 and 800 security dealers participated in distribution.

Estimated net proceeds to the company are $97,870,000 after $380,000 expenses and underwriting discounts or commissions. Proceeds will be used to repay $50,000,000 bank loans incurred last February and the remainder will be added to the corporation's cash fund to finance modernization, extension and replacement of manufacturing plants of subsidiaries (STEEL, May 16, page 32).

Government To Broaden Price Investigation

■ In Washington last week it was reliably reported the department of justice is to broaden its inquiries into "collusive" bidding and basing point systems, including steel's.

A lawyer-economist is being hired from outside the department to head the study. The antitrust division's new appropriation becomes available July 1.

In making the investigation the department is reversing its former position of two years ago when the attorney general reported to the President that not sufficient evidence could be obtained in alleged collusive steel bidding on which to base a court case.

The department has not made an official statement on the subject.

Largest Slabbing Mill Exhibited at Youngstown

■ The 45 x 80-inch, 2-high slabbing mill with attached vertical edger being built for Carnegie-Illinois Steel Corp.'s Edgar Thomson Works by United Engineering & Foundry Co. was shown to visitors at United's Youngstown, O., plant, May 28.

About three stories high, this unit is reported to be the largest ever built. Equipment accompanying the mill includes a huge manipulator which was set up in another building.

Pig Iron Production Drops 12% In May; Six More Furnaces Down

■ COKE PIG iron production in the United States during May fell severely to a point near 1934 levels, the loss of 11 stacks in April showing its full effect on production. With six additional stacks blown out or banked in May, the number of furnaces operating likewise was near the late 1934 figures.

Average daily production in May was 40,675 gross tons, a decrease of 5592 tons, or 12 per cent, from the April rate of 46,267 tons. This was the lowest daily output since December, 1934, when the rate was 33,161 tons and the smallest May since 1933 with a 28,784-ton daily rate. May, 1937, daily output was 114,360 tons.

Total production in May was 1,260,937 gross tons, a loss of 127,071 tons, or 9.2 per cent, compared with the 1,388,008 tons made in April. This total was the smallest since December, 1934, with 1,028,006 tons, and the poorest May showing since 1933 with a production of 892,326 tons.

MONTHLY IRON PRODUCTION

Gross Tons

	1938	1937	1936
Jan.	1,444,862	3,219,741	2,029,304
Feb.	1,306,333	3,020,006	1,838,932
March	1,470,211	3,470,470	2,046,121
April	1,388,008	3,400,636	2,409,474
May	1,260,937	3,545,180	2,659,643
Tot. 5 mo	6,870,351	16,656,033	10,983,474
June	.....	3,115,302	2,596,528
July	.....	3,501,359	2,595,791
Aug.	.....	3,616,954	2,711,726
Sept.	.....	3,417,960	2,728,257
Oct.	.....	2,891,026	2,991,794
Nov.	.....	2,007,031	2,949,942
Dec.	.....	1,503,474	3,125,192
Total	.....	36,709,139	30,682,704

Total production to June 1 this year was 6,870,351 gross tons—9,785,682 tons, or 58.5 per cent, less than first five months of 1937 when total was 16,656,033 tons.

Relating production to capacity, operations in May averaged 29.4 per cent, compared with 33.4 per cent in April and 34.2 per cent in March. Operations in May, 1937, were at an average of 84.3 per cent of capacity.

Active blast furnaces on May 31 totaled 73, a loss of 6 from the 79 operating at the end of April. The May figure was the lowest since December, 1934, when 67 were operating, and is the lowest number for any May since 1933, when only 61 were in blast. Total of 170 were in operation at end of May, 1937.

During May, one merchant and seven steelworks stacks were blown out or banked and one stack in each class resumed operation, making a net loss of 6 stacks for the month.

During May furnaces blowing out or banking were: In Ohio: Youngstown No. 2, Republic Steel Corp. In Pennsylvania: Aliquippa No. 3 and Eliza No. 4, Jones & Laughlin Steel Corp; one Swede, Alan Wood Steel Co. In Alabama: One Pioneer, Republic Steel Corp.; Ensley Nos. 1 and 3, Tennessee Coal, Iron & Railroad Co. In Indiana: Madeline No. 1, Inland Steel Co.

Furnaces resuming were: In Pennsylvania: Monongahela No. 3, National Tube Co. In New York: Troy, Troy Furnace Corp.

AVERAGE DAILY PRODUCTION

Gross Tons

	1938	1937	1936	1935
Jan.	46,608	103,863	65,461	47,692
Feb.	46,655	107,857	63,411	57,675
March	47,426	111,951	66,004	57,120
April	46,267	113,354	80,316	55,719
May	40,675	114,360	85,795	55,986
June	.....	103,843	86,551	51,949
July	.....	112,947	83,735	49,043
Aug.	.....	116,676	87,475	56,767
Sept.	.....	113,932	90,942	59,009
Oct.	.....	93,259	96,509	63,818
Nov.	.....	66,901	98,331	68,876
Dec.	.....	48,499	100,813	68,242
Ave.	45,499	100,573	83,832	57,694

Furnaces Big "Eaters"; 114,204,000 Tons in 1937

■ Raw materials fed into the nation's blast furnaces in 1937 would make a pile one city block square and 1-1/3 miles high, the American Iron and Steel institute estimates.

Total weight of the iron ore, coke, limestone and other materials consumed in making pig iron was 114,204,000 gross tons. Gross tonnage of iron produced was 36,130,000, indicating average consumption of 3.16 tons of raw materials per ton of pig iron produced.

If all the raw materials for the blast furnaces had been hauled at one time by rail, more than 2,200,000 freight cars would have been loaded to capacity—more cars than the railroads had available for service. Cars in such a train would extend nearly 21,000 miles, and moving 30 miles an hour would require nearly a month to pass a given point.

About 4 2/3 trillion cubic feet of air was blown into the furnaces, enough to fill at atmospheric pressure a tank almost two miles square and nine miles high.

MAY IRON PRODUCTION

	No. in blast last day of May	Apr.	Total tonnage Merchant	Non-merchant
Ohio	17	18	39,343	210,012
Penna.	21	23	20,448*	324,550*
Alabama	6	9	58,411	66,466
Illinois	6	6	56,462	72,609
New York	6	5	24,937	78,577
Colorado	1	1		
Indiana	6	7	.....	223,361
Maryland	4	4		
Virginia	0	0		
Kentucky	1	1		
Mass.	0	0		
Tenn.	0	0		
Utah	1	1	.....	85,761
West Va.	1	1		
Michigan	2	2		
Minnesota	1	1		
Missouri	0	0		
Total	73	79	199,601*	1,061,336*

*Includes ferro and spiegeleisen.

RATE OF OPERATION

(Relation of Production to Capacity)

	1938[1]	1937[2]	1936[3]	1935[4]
Jan.	33.6	76.6	48.2	34.2
Feb.	33.6	79.5	46.4	41.4
March	34.2	82.5	48.5	41.0
April	33.4	83.7	59.1	40.0
May	29.4	84.3	63.1	40.2
June	....	76.6	63.6	37.2
July	....	82.9	61.5	35.2
Aug.	....	85.7	64.3	40.7
Sept.	....	83.7	66.9	42.5
Oct.	....	68.4	71.0	45.8
Nov.	....	49.3	72.3	49.5
Dec.	....	35.6	74.2	49.0

[1] Based on capacity of 50,606,400 gross tons, Dec. 31, 1937; [2] first half on capacity of 49,512,737 tons, Dec. 31, 1936—second half on capacity of 49,727,737 tons, June 30, 1937; [3] capacity of 49,777,893 tons, Dec. 31, 1935; [4] capacity of 50,845,741 tons, Dec. 31, 1934. Capacities by American Iron and Steel institute.

Rules in Bethlehem's Favor on Ship Contracts

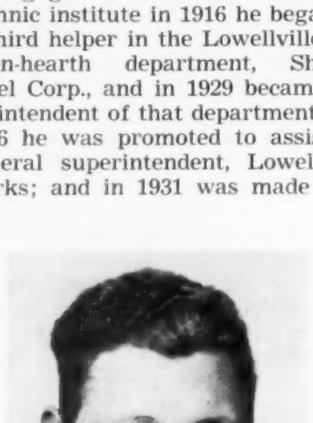
■ In United States district court in Philadelphia last week, Judge Oliver B. Dickinson dismissed the government's suit for $25,000,000 against the Bethlehem Steel Corp. and five subsidiaries, arising out of war-time ship contracts. He upheld William Clark Mason, who as special master, decided the case in Bethlehem's favor two years ago.

The court permitted Bethlehem to retain more than $19,000,000 in profits already received and to be paid an additional $5,600,000 with interest at 2 per cent from September, 1922.

Although criticizing the bonus type of contract under which ships were built, the court held the terms were known to the government's Emergency Fleet corporation, and there was no fraud or deceit.

MEN OF INDUSTRY

■ JOSEPH H. CARTER, since March, 1936, general superintendent, Pittsburgh Steel Co., Pittsburgh, has been elected vice president in charge of operations, and a director. Following graduation from Rose Polytechnic institute in 1916 he began as a third helper in the Lowellville, O., open-hearth department, Sharon Steel Corp., and in 1929 became superintendent of that department. In 1926 he was promoted to assistant general superintendent, Lowellville works; and in 1931 was made general superintendent, a post held until he went to Pittsburgh.



Joseph H. Carter

♦

Walter K. Dow, for the past year plant superintendent, Alexander Milburn Co., Baltimore, has been elected vice president.

♦

Robert T. Forbes, 201 Devonshire street, Boston, has been appointed representative in the New England territory for American Engineering Co., Philadelphia.

♦

Edward L. Solomon, of Max Solomon Co., Pittsburgh, has been appointed chairman of the arbitration committee of the Institute of Scrap Iron and Steel Inc., New York.

♦

Hugh Morrow, president, Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., has been elected to succeed the late Fairfax Harrison as a director of Southern Railway system.

♦

Burnett Bear has been named contracting manager in Cleveland for Bethlehem Steel Co. Following graduation from Cornell university in 1922 he became associated with McClintic-Marshall Corp., and when that firm was acquired by Bethlehem he continued with the latter.

♦

Bert Morley has resigned as vice president and sales manager, Kelsey-Hayes Wheel Co., Detroit, to become sales manager of Ferro Stamping & Mfg. Co., Detroit.

♦

J. B. Wittrup, associated with the Manhattan Rubber Mfg. division of Raybestos-Manhattan Inc., Passaic, N. J., 23 years, has been named manager of the Chicago mechanical rubber branch of the company.

♦

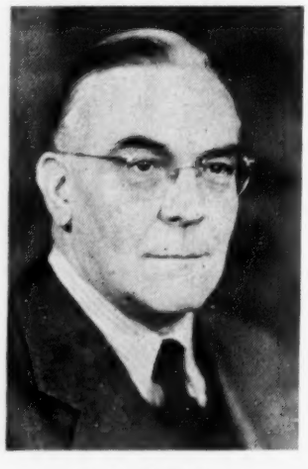
William G. Shanely, Reading, Pa., former manager and director of sales for the Mt. Penn Stove Works, Reading, has been placed in charge of sales in eastern Pennsylvania, New Jersey, Maryland and Delaware for the Renown Stove Co., Owosso, Mich.

♦

Philip O. Geier has been elected president, Ohio Manufacturers' association. He is chairman of the board and treasurer, Cincinnati Milling Machine Co., chairman of the board, Cincinnati Grinders Inc., trustee of the Cincinnati Southern railroad, and officer and director in other important organizations.

♦

Ross L. Leffler, heretofore manager of industrial relations, Pittsburgh district, Carnegie-Illinois Steel Corp., and George P. Wardley, superintendent of industrial relations at the company's South Chicago works, have been appointed director of industrial relations and assistant director of industrial relations, respectively. Mr. Leffler's headquarters will remain in Pittsburgh and Mr. Wardley will maintain offices in Chicago. The appointments were made under the new organization of the industrial relations department with D. A. Barrett, vice president, in charge.

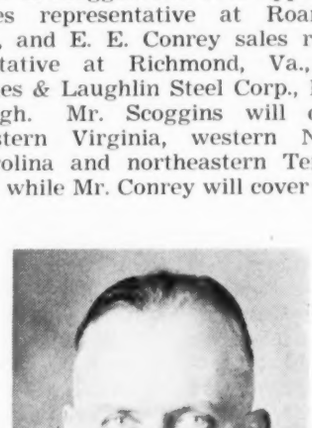


G. P. Wardley

Mr. Leffler has been associated with Carnegie-Illinois and its predecessor 28 years, while Mr. Wardley has been identified with United States Steel Corp. subsidiaries since 1907.

♦

R. G. Scoggins has been appointed sales representative at Roanoke, Va., and E. E. Conrey sales representative at Richmond, Va., for Jones & Laughlin Steel Corp., Pittsburgh. Mr. Scoggins will cover western Virginia, western North Carolina and northeastern Tennessee, while Mr. Conrey will cover eastern Virginia and eastern North Carolina.



Ross L. Leffler

♦

Robert H. Heyer, metallurgist in the research laboratories, American Rolling Mill Co., Middletown, O., has been awarded the Charles B. Dudley medal of the American Society for Testing Materials for his paper "Analysis of the Brinell Hardness Test," presented at the society's 1937 meeting. The medal will be presented to Mr. Heyer at the 1938 meeting of the society June 27-July 1 at Atlantic City, N. J.

♦

L. B. Hampton has been made manager of the Pacific northwest district of Crane Co., Chicago, succeeding F. A. Nitchy, who is retiring after 46 years service with the company. Mr. Hampton joined Crane Co. in 1903.

Robert C. Smith succeeds Mr. Hampton as manager of the Portland, Oreg., branch.

♦

John A. Coe, American Brass Co., was elected president, Copper and Brass Mill Products association at its annual meeting in Hot Springs, Va., May 20-21. Other officers elected were: Vice presidents, R. E. Day, Bridgeport Brass Co.; Wylie Brown,

Phelps Dodge Copper Products Corp.; R. L. Coe, Chase Brass & Copper Co.; treasurer, C. D. Dallas, Revere Copper & Brass Inc.; secretary, T. E. Veltfort.

♦

Earl L. Ramsey, associated with the Ex-Cell-O Corp., Detroit, since April, 1927, first as manager of its Buffalo office and since May, 1934, a member of the Detroit sales staff, has been appointed to take charge of sales of the Ex-Cell-O diesel fuel injection equipment division. Carroll R. Alden, who formerly divided his time between sales and engineering, has been named chief engineer of the division.

Al Klomp has been appointed to take over the accounts that have been served by Mr. Ramsey.

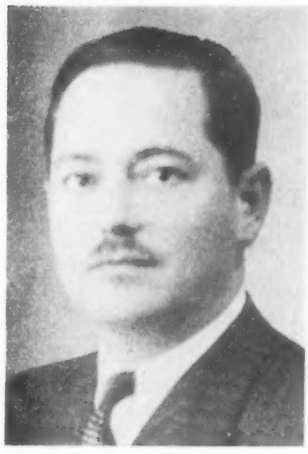
♦

F. J. Christie, heretofore assistant general superintendent, Vandergrift, Pa., works of Carnegie-Illinois Steel Corp., Pittsburgh, has been named acting general superintendent. He has been serving in this capacity for several months due to the illness of D. G. Buchanan, general superintendent.

James M. Bortz formerly superintendent, bar and blooming mills, has been appointed assistant to general superintendent, and E. J. Parsons, superintendent of open-hearth, has been made superintendent of the open-hearth and rolling mills at Vandergrift.

♦

A. J. Koetsier has been appointed superintendent, Micarta division, Trafford, Pa., Westinghouse Electric & Mfg. Co. He succeeds A. J. Bastian, assigned to special duties in connection with the promotion of Micarta products through service channels. Mr. Koetsier entered the employ of Westinghouse in 1922. In August, 1923, he went with the Wolverine Brass Co., Grand Rapids, Mich., remaining with that company until last May when he returned to Westinghouse as a member of the staff of the vice president's office.



J. M. Chapple

♦

Floyd A. Beatty has resigned as senior vice president, in charge of plant operations, Lewis Foundry & Machine Co., a division of Blaw-Knox Co. Mr. Beatty became associated with the Lewis organization in 1925, and served successively as chief engineer, operating vice president and vice president in charge of engineering and machinery sales. He developed the three-high sheet roughing mill. He is a member, Association of Iron and Steel Engineers, and American Iron and Steel institute.

♦

Cortlandt W. Handy, since 1927 president of Handy & Harman, New York, has become chairman of the board. G. H. Niemeyer, associated with the firm 38 years, succeeds Mr. Handy as president. R. H. Leach, manager of the Bridgeport plant and director of research, has been made vice president in charge of production and research. H. W. Boynton and H. W. Spaulding continue as treasurer and secretary, respectively, and J. C. Travis, in the newly created office of assistant to the president, will have charge of sales.

♦

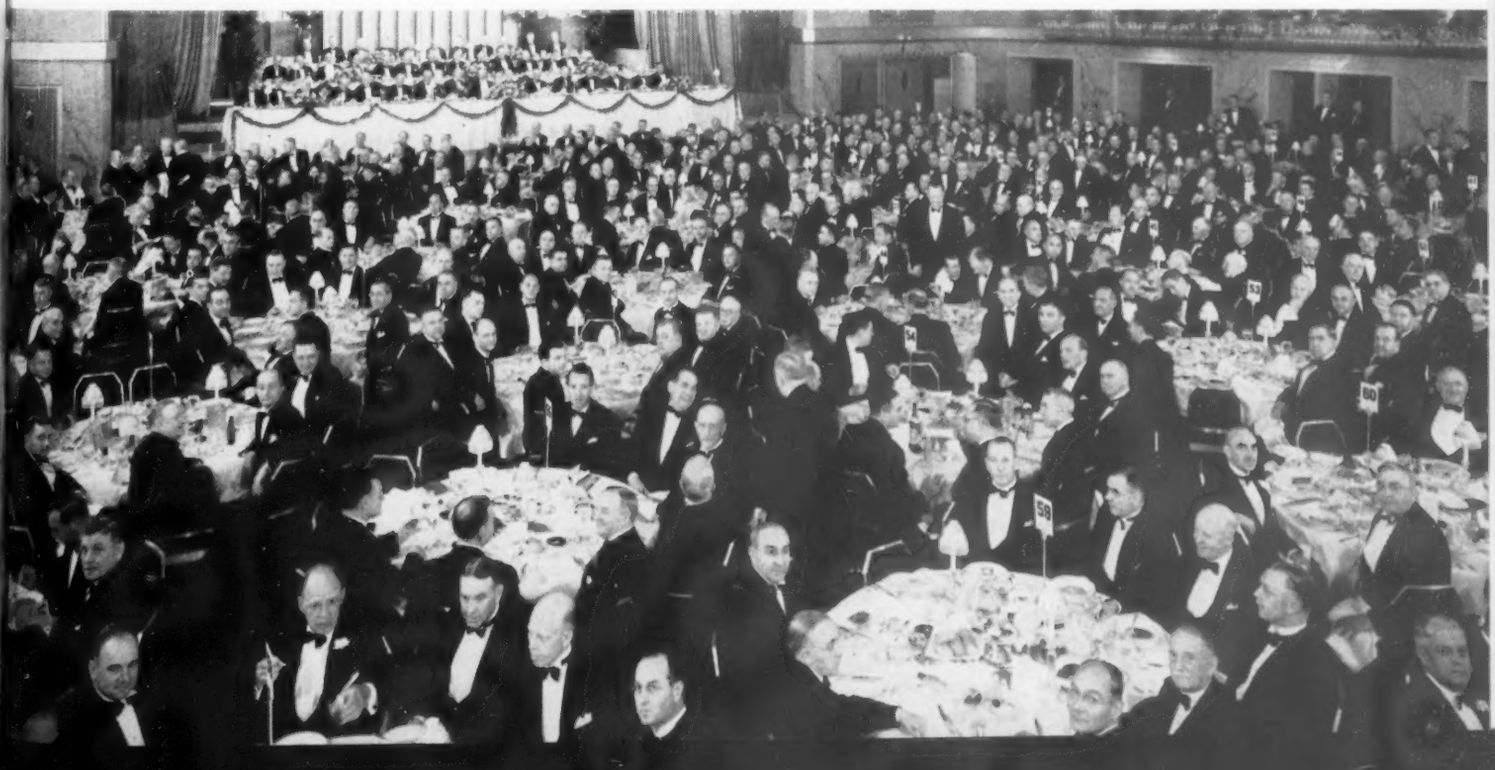
J. M. Chapple has been appointed managing director of Lincoln Electric Co.'s new manufacturing subsidiary, Lincoln Electric Co. (Australia) Pty. Ltd., recently established at Alexandria, (Sydney) Australia. Mr. Chapple will be in charge of manufacturing, sales and advertising. For 13 years he had been associated with Armco International Corp., most of that time in foreign service. As welding development engineer, he installed equipment and developed the sales organization of the joint Armco International-Lincoln Electric arc welding electrode factory in Buenos Aires, Argentina. Mr. Chapple who recently returned from a five-month investigational trip in Australia, expects to return to Sydney the latter part of this month.

♦

Robert O. Haxby, University of

Steel Institute Banquet

■ **Though limited to members this year, attendance at the American Iron and Steel institute's forty-seventh general meeting and banquet in the Waldorf-Astoria, New York, May 26, numbered about 1000. For complete report see STEEL, May 30, pages 13-17**



Minnesota; John A. Hipple, Princeton university; Sidney Siegel, Columbia university; W. E. Shoupp, University of Illinois, and W. E. Stephens, California Institute of Technology, are the first Westinghouse research fellows to be selected for work in fundamental science at the Westinghouse Research Laboratories in East Pittsburgh, under a plan announced last December by Westinghouse Electric & Mfg. Co., whereby it plans to support the work of ten young physicists on fundamental studies broadly related to the electrical industry.

♦

George A. Higgins, for three and a half years assistant manager of sales, Pittsburgh district, Carnegie-Illinois Steel Corp., has been named assistant manager of sales of the bar, strip and semifinished materials division. He began his service with the company in 1919 when he returned from the World war naval aviation service.

DIED:

■ J. F. KOHLMORGAN, 46, chief engineer since 1924, Alan Wood Steel Co., Conshohocken, Pa., May 28. Prior to his affiliation with Alan Wood he was with Inland Steel Co. and Interstate Iron & Steel Co.

♦

Theodore R. Tiesler, 82, president, St. Louis Wire & Iron Co., in that city, May 18.

♦

Fred J. Bartlett, 45, founder and owner, Industrial Electric & Machine Co., High Point, N. C., in High Point, March 4.

♦

James W. Gier, 64, for 25 years purchasing director, Motor Wheel Corp., Lansing, Mich., in Chicago, recently.

♦

Leif Lee, consulting engineer and former chief engineer, Youngstown Sheet & Tube Co., Youngstown, O., in that city, May 30.

♦

Thomas H. Taylor, 82, former eastern sales manager for American Steel & Wire Co., Cleveland, at his home in Higganum, Conn., May 21. He was associated with Steel & Wire since its organization in 1899 until 1922 when he retired.

♦

George E. Roehm, 73, formerly identified with a number of Detroit industries but retired several years ago, May 28. During his career he had been affiliated with the Milwaukee Bridge Co., Detroit Bridge & Iron Works, Canadian Bridge Co.; director and secretary, Hupp Motor Car Co. and president and chairman of the board, Motors Metal Mfg. Co.

George A. Higgins

MEETINGS

AUTOMOTIVE ENGINEERS TO CONDUCT SUMMER MEETING

■ DR. J. S. THOMAS, president, Chrysler Institute of Engineering, Detroit, will address a passenger car body session during the summer meeting of the Society of Automotive Engineers at the Greenbrier, White Sulphur Springs, W. Va., June 12-17. His subject will be "Economics of Weight and Size for the Car of Tomorrow." W. J. Cameron, Ford Motor Co., Dearborn, Mich., will speak at a general session. Convention sessions will deal with design of automotive and aircraft engines, passenger car chassis and bodies, fuels and lubricants.

RESISTANCE WELDER GROUP SEEKS BETTER CONDITIONS

Resistance Welder Manufacturers association will hold a meeting at the Recess club, Detroit, June 9. The association is developing a program of activities designed to improve conditions in the industry, the work being handled by several committees. Preliminary reports were considered at a meeting in Detroit in May, and it is expected that a number of recommendations will be acted upon finally at the coming meeting.

A subject of considerable concern is development of standard transformer specifications and a committee studying it will make a report. The association is preparing to give publicity to its recommendations.

MARKETING CONFERENCE TO STUDY BUSINESS VIEWPOINTS

An effort to crystallize and coordinate varying viewpoints of government, business and labor, will be undertaken at an industrial marketing conference in Detroit, June 14, under sponsorship of the Detroit chapter, National Industrial Advertisers association. The meeting will be held in conjunction with the annual convention of the Advertising Federation of America in Detroit that week. A number of local business and technical societies will participate.

A number of the leading exponents of federal, industrial and labor viewpoints will address the conference. Among these will be Donald Richberg, speaking on "Teamwork for Prosperity."

FOREMEN'S ASSOCIATION TO CONDUCT FIRST EXHIBIT

National Association of Foremen announces its first exposition to be held with its fifteenth annual convention in Goodyear Hall, Akron, O., Oct. 14-16. The association states that decision to conduct an exposition is based on a series of experimental exhibits held in connection with its convention in 1937.

An attendance of some 5000 members, in addition to an invited list of industrial purchasing agents, is anticipated. H. G. Evans, Goodyear Tire & Rubber Co., Akron, O., is president of the association. A. C. Horrocks, of the same company, is educational director and general chairman of the convention and exposition committee.

HEATING ENGINEERS WILL STUDY AIR CONDITIONING

American Society of Heating and Ventilating Engineers will conduct its summer meeting at the Homestead, Hot Springs, Va., June 20-22. The program lists ten technical papers dealing with heating and air conditioning problems and an extensive series of entertainment features. A. V. Hutchinson, 51 Madison avenue, New York, is secretary.

World Tin Consumption Drops 20.2 Per Cent

■ World tin consumption in the first three months of 1938 was 40,700 tons, compared with 51,000 tons in the corresponding period in 1937, according to International Tin Research and Development council.

Tin production in the first quarter was 43,200 tons, compared with 46,300 tons in the same period last year.

Tin plate production in the United States in 1937 amounted to 2,421,614 tons, manufacture of which required 41,012 tons of tin, according to revised figures by the American Bureau of Metal Statistics. This revision brings world tin plate production in 1937 to 4,257,000 tons, against 3,712,000 tons in 1936. In the first quarter 1938, world tin plate output decreased 38 per cent to 920,000 tons compared with 1,478,000 tons in the first quarter of 1937.

Activities of Steel Users, Makers

■ JONES & LAUGHLIN STEEL CORP., Pittsburgh, has opened a new sales office in Harrisburg, Pa., under the direction of W. J .Harvey, district sales representative. Mr. Harvey has represented Jones & Laughlin in that territory since 1925, having been with the company since 1910. The Harrisburg office, located at 600 North Second street, will be a sub-office of the Philadelphia district sales division.

♦

General Cable Corp., Chicago, has moved from 20 North Wacker drive to 111 North Canal street.

♦

Union Metal Co., Los Angeles, has moved its offices and warehouse from 1001 North Mansfield avenue to 1795 Pasadena avenue.

♦

Foxboro Co., maker of industrial precision instruments and controllers, has moved its Dallas, Tex., office and branch factory to new quarters at 1710 North Akard street.

♦

Phoenix Iron Co. has moved its executive offices to Phoenixville, Pa. The Philadelphia sales office will be retained in the Girard Trust building, 1400 South Penn square.

♦

Micromatic Hone Corp. and Barnes Drill Co. now are represented in the New England territory by F. A. Parker, 20 Fern street, Auburndale, Mass.

♦

Hisey-Wolf Machine Co., Cincinnati, maker of portable electric machine tools, has appointed J. F. Gruber, 528 East Montana street, Milwaukee, factory representative in Wisconsin.

♦

Austin Co. of Canada Ltd. is completing the first unit of a hangar designed to accommodate aircraft of any wing spread for Trans-Canada Airlines at Winnipeg, Manitoba. Structure has a 70-ton jack truss and is designed for ultimate extension to provide a series of 200-foot spans. Hangar and two-story administration building required a total of 490 tons of structural steel.

♦

Tungsten Carbide Tool Co., division of Michigan Tool Co., Midwest Tool & Mfg. Co., and Morse Tool Co., all of Detroit, have signed dealer contracts with Vascoloy-Ramet Corp., North Chicago, Ill.

♦

James Coulter Machine Co., specializing in design and construction of automatic machinery, has opened its new plant at 386-404 Mountain Grove street, Bridgeport, Conn.

♦

Pangborn Corp., Hagerstown, Md., has moved its New England offices to 175 State street, Springfield, Mass. J. H. Connolloy, previously associated with the company's Detroit office, is in charge.

♦

Austin-Hastings Co. Inc., distributor of machine tools, metalworking and welding equipment, Cambridge, Mass., will conduct a machine tool show at the Boston Garden Exposition hall, Boston, June 8-11.

♦

Detroit Harvester Co., Detroit manufacturer of automotive parts and farm implements, has acquired the business of Prestole Devices Inc., Detroit, maker of sheet metal fastening devices. Manufacturing operations will be continued at the Prestole plant, with certain operations being transferred to the Harvester company's Dura division at Toledo, O. Harold W. Kost, formerly Prestole president, becomes head of Harvester's Prestole division.

♦

Vol. 1 No. 1 of *The Core* has been published by the Quandt Chemical Co., San Francisco. This new house organ is designed to be of interest to foundrymen, engineers and others dependent upon fine castings in modern machine design.

♦

Capitol Steel Corp., New York, has moved its offices from 186 Joralemon street, Brooklyn, to 15 East Fortieth street, Manhattan. The company will continue to maintain its warehouse in Jersey City, N. J.

♦

High Speed Hammer Co. Inc., Rochester, N. Y., maker of high speed riveting machinery and precision drilling machines, has appointed E. L. Essley Machinery Co. as exclusive representative in western Michigan, Illinois, Wisconsin, Iowa and Nebraska.

♦

Koppers Co.'s Western Gas division, Fort Wayne, Ind., recently booked orders from the New York department of water supply, gas and electricity for 166 12-inch gate valves, and from the Chicago department of public works for thirty 24-inch and ten 36-inch gate valves.

♦

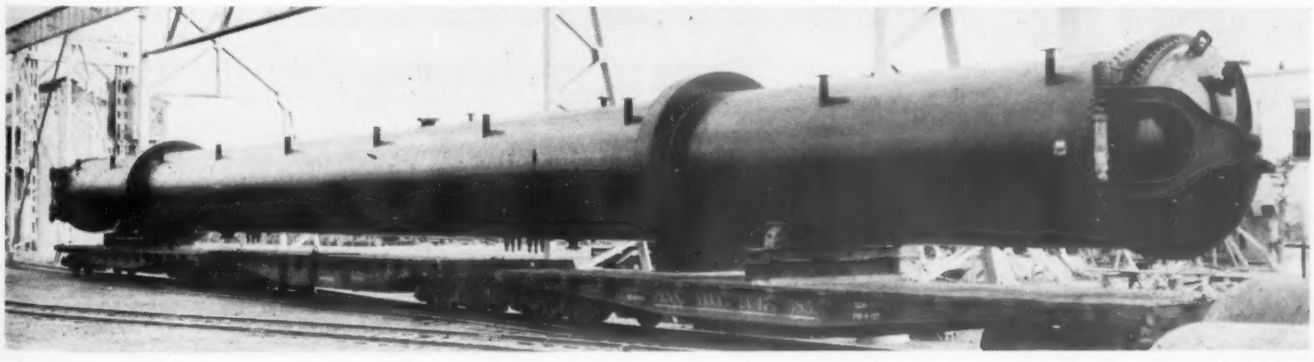
Igoe Brothers Inc., with warehouses at Brooklyn, N. Y., Jamaica, Newark and Asbury Park, N. J., has been appointed distributor for Stran-Steel framing in those districts, by the Stran-Steel division of Great Lakes Steel Corp., a unit of National Steel Corp.

♦

C. & G. Foundry & Pattern Works, Indianapolis, has purchased the Enterprise Iron Works, Indianapolis, maker of fences, railings and ornamental iron work. No change will be made in operations of either firm and they will be continued as separate organizations.

Creosoting Cylinder

■ **This welded steel creosoting cylinder, built by Chicago Bridge & Iron Co., in its Birmingham, Ala., plant for Republic Creosoting Co., Lima, O., is 151 feet, 6¾ inches long, 8 feet in diameter, weighs about 222,000 pounds. It is designed for a working pressure of 200 pounds per square inch. Shipment was made by means of three 50-foot flat cars**



FOR GRINDING THE WORLD'S LARGEST TELESCOPE

Slowly and with extreme care, a 200-inch glass reflector is being ground for the observatory of California Institue of Technology on Mt. Palomar, California. When finished, it will become part of the largest telescope in the world. The special grinding gear for this critical task was cast of MEEHANITE, superior modern metal for extra-heavy, intricate, or otherwise difficult castings. Among the properties obtainable in MEEHANITE are high strength, toughness, uniformity, machinability, heat resistance, wear resistance, corrosion resistance. Costs are relatively low. If you are a user of metals, learn about the recent advancement in castings. Ask about MEEHANITE. Address any of the manufacturers listed below, or Meehanite Research Institute, Vandergrift Building, Pittsburgh, Pennsylvania.

METAL MEEHANITE

MANUFACTURERS:

American Laundry Machinery Co.	Rochester, N. Y.
Atlas Foundry Co.	Detroit, Mich.
Banner Iron Works	St. Louis, Mo.
H. W. Butterworth & Sons Co.	Bethayres, Pa.
Cincinnati Grinders Incorporated	Cincinnati, Ohio
The Cincinnati Milling Machine Co.	Cincinnati, Ohio
Cooper-Bessemer Corporation	Mt. Vernon, Ohio
M. H. Detrick Co.	Peoria, Ill., Newark, N. J.
Farrel Birmingham Co.	Ansonia, Conn.
Florence Pipe Foundry & Machine Co. (R. D. Wood Company, Philadelphia, Selling Agents)	
Fulton Foundry & Machine Co.	Cleveland, Ohio
Greenlee Foundry Company	Chicago, Ill.
Hamilton Foundry & Machine Co.	Hamilton, Ohio
Kanawha Manufacturing Co.	Charleston, West Va.
Kinney Iron Works	Los Angeles, Calif.
Koehring Company	Milwaukee, Wis.
E. Long, Ltd.	Orillia, Canada
Rosedale Foundry & Machine Co.	Pittsburgh, Pa.
Ross-Meehan Foundries	Chattanooga, Tenn.
The Stearns-Roger Mfg. Co.	Denver, Colo.
Vulcan Foundry Company	Oakland, Calif.
Warren Foundry & Pipe Corp.	Phillipsburg, N. J.
Washington Iron Works	Seattle, Washington
Australian Meehanite Metal Co., Ltd.	Waterloo, N. S. W.
The International Meehanite Metal Co., Ltd.	London
Meehanite Metal Corporation	Pittsburgh, Pa.

MIRRORS OF MOTORDOM

DETROIT

■ SCHEDULING of automobile assemblies by leading builders has undergone two major changes since the sharp drop in retail demand last fall, the second of these changes having been effected only recently. When car buying first slumped, it was the prevailing policy to keep as many men at work as possible, reducing the number of production days per week.

This resulted in a comparatively small number of layoffs, but a terrific drop in weekly earnings. When it became evident weekly pay envelopes were too thin in some cases even to furnish subsistence, decision was made to lay off a good percentage of working forces altogether and to return the rest to four and five days of work per week.

This helped to some extent, and permitted those dropped from payrolls to become eligible for relief work which they could not get as long as they realized even a small income from automobile jobs.

Will Keep Plants Open

As the spring months waned and the expected upturn in car buying failed to materialize to any great extent, the likelihood of a complete shutdown of manufacturing operations during June, July and August was being discussed widely. The feeling was prevalent that dealer or field stocks were ample to tide the industry over until 1939 model assemblies got under way; hence why keep plants open to turn out cars which might eventually have to be sold at cost or even at a loss?

Lately, however, plans are being drawn up to cut back present assembly rates and spread schedules out thinly over June and July, thereby returning to the original plan, with the exception working forces are considerably smaller than when the short schedules first went into effect.

The present plan also provides for the filling of special orders, calling for different upholstery, trim, accessories, etc., which would have to be refused if plants were closed.

Ford assembly lines are due to start this week after a 10-day shutdown, with 19 days of production in prospect for this month.

BY A. H. ALLEN
Detroit Editor, STEEL

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■ MANY explanations have been offered for the sudden collapse of automobile buying since last fall. While it is true the retail market probably was oversold last year by threats of higher prices, another line of thought has been expressed which may have more than a little bearing on the question. This is the influence of the pronounced spurt in the buying of homes in the $2000-$10,000 class, fostered by the

Fits Cam Bearing Liners in One Operation

■ **Fitting cam bearing liners into bearing bores on the cylinder block assembly line at the De Soto plant has been reduced to a simple operation with this new horizontal Oilgear machine. Workman slips liners into place and rolls block onto machine. In one operation bearings are pressed into place and the block rolls on to receive other parts**

new FHA plan which requires only a 10 per cent down payment.

With a down payment of as little as $200 or $300 being about the only requirement for purchase of this type of dwelling, it is reasonable to suspect that thousands of families have applied savings on the purchase of a home rather than a new car. Appeal of owning a house with monthly payments less than rent of a comparable dwelling is proving irresistible to many, and beyond question the automobile industry has suffered.

Another potent factor which works adversely on automotive sales is the gradual elevation of the plane of living of low-income groups. Where at one time about the only luxury such families permitted themselves was an automobile, now they must have radios, electric refrigerators and numerous other competitive commodities. These people have become imbued with the spirit of "keeping up with the Joneses" and have become determined not to deny themselves modern luxuries at all within their reach.

■ AMONG seldom-mentioned but vital parts of an automobile assembly are garnish moldings, the formed steel strips fastened around the inside of windows and windshield. The average guess as to the steel tonnage annually going into these moldings probably would be far off the accurate figure, hence a little investigation of the matter may be apropos.

Taking a Chevrolet two-door sedan as a typical car, a hasty once-over with a tape measure shows about 39 feet of garnish molding on the four windows, rear window and windshield. Assuming this to be the average footage for the 4,000,000 passenger cars built last year, 156,000,000 feet of molding is the indicated consumption.

These moldings usually are of 21-gage cold-rolled strip, weighing 360 pounds per thousand feet. Thus, 56,160,000 pounds or 28,080 tons of steel was required for the fabrication, exclusive of any amount scrapped in their production. It is safe to say about 30,000 tons of cold-rolled strip found its way last year into garnish moldings.

There are a number of producers of this molding locally—Motor Products, Peninsular Metal Products, Ainsworth Mfg., Detroit Moulding, Ternstedt, and to some extent Briggs. Finish on most is any one of several variations of the so-called wood-grain finish. The Oxford Varnish Co. controls licenses to use one system of finishing, and in turn has licensed Motor Products, Peninsular and Detroit Moulding to use the method. General Motors through its Ternstedt division has been using a similar process and a recent infringement suit in federal court brought by Oxford Varnish was decided in favor of Ternstedt. The decision, however, is being appealed and litigation may drag out for some months.

Meanwhile Oxford Varnish has developed a newer system now being used by its licensees which differs appreciably from the old method involved in the above-mentioned suit. The new method centers around what is called a "glow-wood" finish claimed to be far superior to the former finish.

Now Briggs has come into the picture, with its new plant nearing completion in which it is stated at least a part of the production will be garnish moldings for the Chrysler lines. Since Chrysler now is using the Oxford finish supplied by the three licensees it remains an open question just what system Briggs will use on its moldings. For a time Briggs was supplying painted moldings for Plymouth, thus avoiding any conflict with the woodgrain finish, but early this year, specifications were changed to the latter type.

Should Briggs take away all the Chrysler garnish molding business for 1939 models, as appears likely, this will leave only Ford as a major outlet for products of the Oxford licensees.

Another type of finish for moldings is that developed by the Dinoc interests in Cleveland, now used to some extent. A sudden switch on the part of automobile builders to, say, a stainless steel molding or a porcelain enameled molding, might leave all present suppliers holding the bag. Stranger things have happened.

■ SOME grounds are apparent for the belief the rate of steelmaking operations will start climbing shortly after the first of August. Inventories are now down to rock bottom among most of the smaller and medium-size steel users. Buying is from day to day, with rush delivery usually specified.

According to some steel observers, likelihood of at least some fair tonnages coming out from auto plants by Aug. 1 for new model work may move deliveries back a couple of weeks on certain items, and thus some of the smaller users might be forced to buy ahead a little more to prevent being caught short.

Combination of these circumstances, plus the strengthening influence of government spending programs, may serve to lift operations to above the 40 per cent level by mid-August—at least that is the fervent hope of more than one steel seller in this territory.

Revision of flat-rolled steel prices has reacted to the benefit of users of wide sheets in the thinner gages, and to the slight disadvantage of the users of narrower widths and heavier gages. The change also has put more pressure on old-type hand sheet mills in favor of continuous mills, but this was to be expected with the constant growth and improvement of continuous sheet and strip mills.

■ THIRD largest labor organization in the country—the United Automobile Workers unit of the CIO—in its latest financial report reveals it spent in excess of $1,000,000 in the last half of 1937, while the treasury balance dropped from $428,779 on June 30, 1937, to $182,889 on Dec. 31, 1937. At this rate of decline, the UAW treasury must be in precarious straits at the moment.

Expenditures last fall included $36,000 to support the union's unsuccessful municipal election campaign in Detroit. Another $73,904 was spent in the unsuccessful drive to organize Ford employes, not counting an outlay of $13,117 for publication of a special edition of Upton Sinclair's derogatory "Flivver King." Salaries of seven officers totaled $12,414, of organizers and office workers $218,294.

Per capita taxes on an indicated membership of 269,000 yielded $565,002 in six months. Initiation fees brought in $74,836. These are a few highlights of the latest million-dollar business to feed off the automobile industry.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

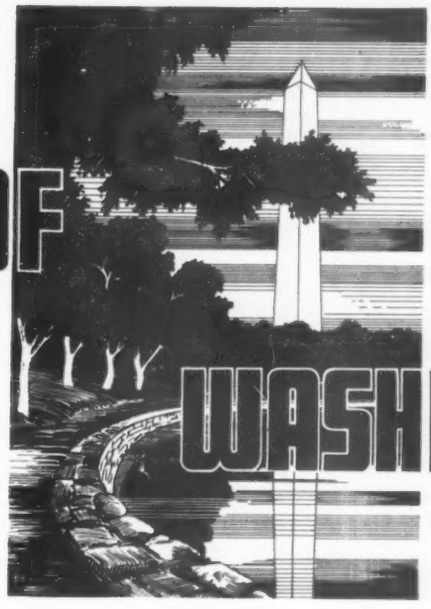
	1936	1937	1938
Jan.	377,244	399,186	227,744
Feb.	300,810	383,900	202,872
March	438,943	519,022	238,753
April	527,625	553,231	238,133
4 mos.	1,644,622	1,855,339	907,502
May	480,518	540,377	*210,000
June	469,368	521,153	.....
July	451,206	456,909	.....
Aug.	275,934	405,072	.....
Sept.	139,820	175,630	.....
Oct.	230,049	337,979	.....
Nov.	405,799	376,629	.....
Dec.	518,958	346,886	.....
Year	4,616,274	5,015,974	.....

*Estimated.

Week ended	
May 7	53,385
May 14	47,415
May 21	46,810
May 28	45,120

(Production figures for the week ended June 4 will be found on page 21.)

WINDOWS OF WASHINGTON



WASHINGTON

■ THE United States Supreme Court handed down a decision last week holding that the national labor relations board has authority to reopen its case against the Republic Steel Corp. It is believed this ruling also will be applicable to the board's controversy with the Ford Motor Co.

The Supreme Court's decision held that the labor board may withdraw from the third circuit court of appeals at Philadelphia litigation involving an order directing the Republic to reinstate 5000 striking employes.

Republic Steel and the Ford Motor Co. had resisted efforts of the board to withdraw its orders and reopen litigation to revise procedure in line with court findings. The Philadelphia court refused permission to withdraw, but the opinion by Justice Roberts reversed the circuit court findings.

Upholds NLRB Powers

"Since the statute empowers the board, before the filing of a transcript, to vacate or modify its orders, certainly it does not confer jurisdiction upon the reviewing court to prohibit the exercise of the power," ruled Justice Roberts.

"It is obvious that congress intended to confer no jurisdiction upon the reviewing court to prevent the board from seasonably vacating or modifying its order so as to make it comport with right and justice. . . .

"We have no occasion to speculate upon the future proceedings before the board. It is enough that the petition shows that the board desired to and would have vacated its order had it not been restrained by the action of the court. What the legal effect of its future proceedings may be we need not decide."

The decision was 5 to 2, Justices Butler and McReynolds dissenting and Justices Stone and Cardoza not participating.

In dissenting, Butler and McReynolds said the lower court should have been affirmed in its refusal to reopen the case, contending the Philadelphia court had jurisdiction, and any other construction "would let the board by refusing to certify a transcript of precedings before it, prevent judicial review of its orders."

"While there is room for difference of opinion on these questions," said Butler and McReynolds, "it is hard to perceive on what ground it may be held that the court was without jurisdiction to decide them or even to conclude that the order was an arbitrary exertion of power, or that restraint against further delay by the board involved an abuse of discretion."

Another decision rendered on the last day of the term dealt with the Kansas City stockyards case, in which the court refused to reconsider its ruling as requested by Secretary of Agriculture Wallace and the department of justice.

May Reopen Republic Case

In deciding the stockyards case a few weeks ago the court held that Wallace's department, by failing to publish findings of fact, had denied a fair hearing in a proceeding to lower rates charged by the stockyard men. It was based on this decision that Republic Steel Corp. was given opportunity to attack the labor board in the lower court, but this has now been proven of no avail and under the Supreme Court's ruling, the labor board can reopen the Republic case in any way in which it sees fit.

BY L. M. LAMM

Washington Editor, STEEL

■ The wage and hour bill was sent to conference early last week, and while the conferees have not yet taken action it is possible a conference report will be before congress for final action as this issue is published.

It is absolutely impossible to foretell what the outcome will be, but there is no question Capitol Hill is restive and anxious to get home. There is considerable difference between the bill as it passed the senate and the house, and it is questionable as to just how this can be compromised.

Must Have Sound Bill

Senator Thomas, Utah, chairman of the labor committee of the senate, last week expressed great doubt of the constitutionality of the bill as it passed the house. The senator was making an effort to write flexible differentials into the house measure. In this connection he said:

"While the senate measure, setting up jurisdictional wage-hour standards, is of unquestioned constitutionality, the house bill might be struck down in the Supreme Court on the 'due process' clause of the fifth amendment.

"Constitutionality of any wage-hour measure is certain to be attacked by some industries, anyway. It is essential that we draft the soundest possible bill."

There was interesting speculation here last week as to what will happen if the bill finally becomes law. Some Washington observers believe Washington again will become the Mecca for businessmen as it was during NRA days. Under one of the bills, it is necessary to determine conditions in industry before setting wages and hours and

this will undoubtedly involve protracted hearings and conferences.

SENATOR SAYS PRESIDENT DOESN'T UNDERSTAND TAX

President Roosevelt stepped into a hornets' nest when he severely critized the new tax bill. Senator Harrison, Mississippi, chairman of the finance committee of the senate, who had charge of the bill in that body, made the most important speech against the President's attitude. However, there was considerable hard feeling on Capitol Hill even among the new dealers.

Senator Harrison, who apparently has been trying to go along with the administration as far as possible, repeatedly said during his address that he felt the Chief Executive had been misinformed as to certain sections of the measure. He flatly denied some of the statements made by the President over the radio.

Senator Harrison urged the American people not to be "misinformed" by the attack which Mr. Roosevelt had made. Before crowded galleries and a closely attentive senate, Harrison stated that the President's examples of the operations of the tax were in error and that the bill had been written to aid in "dispelling fear and restoring confidence and to give some impetus to the country in getting back on a road to recovery." He said several times that he did not question the President's sincerity, but he repeated that the Chief Executive had been "misinformed." This applied, particularly, he said, to the major example given by the President.

Will Thaw Much Credit

Harrison went through the measure, defending each major provision, declaring that the capital gains and undivided profits tax as finally worked out by the senate and house, retaining a fragment of the latter and imposing flat taxation rather than formally graduated levies on the former, would "unfreeze much of the credit of the country." He added:

"It ought to be most helpful in getting some industries started, and in relieving the distress caused by the unemployed situation in this country."

In his conclusion he warned that the full revenues expected from the bill were based on November estimates, saying:

"The thing I fear about the law, which goes into effect today, is not that we have abandoned any American principle, for we have not. The thing that I fear is that we will not be able to obtain as much revenue under the law as we had hoped for and as the treasury had estimated.

"All of us know, unless blind to the situation, that conditions have gradually grown worse since November. More persons are out of employment and more industries have closed their doors."

He noted his belief that if the President had vetoed the measure, congress would have overriden the veto.

RADICAL CONGRESSMEN AIR THEORIES OF BUSINESS CURE

Several members of congress addressing a convention here last week advocated government ownership of the iron and steel industry, railroads, banking and credit, and natural resources.

Representative Teigen, Minnesota, who introduced a bill in the house some time ago for public ownership of the iron and steel industry, charged the dictatorship in these industries "has failed the men who really make steel and dig iron from the earth."

Senator Frazier, North Dakota, in explaining his bill for a government farm marketing corporation, declared: "Our whole system of markets, distribution, finance and credit are controlled by the greedy, p r o f i t-a t-any-price monopolistic group, and a comparatively small group is the cause of the past depression and the present recession."

Charging that "the railroads have completely broken down and allowed their rolling stock and general equipment, as well as roadbeds to deteriorate," Senator Lundeen, Minnesota, urged that the government buy railroads, which he said could be acquired at a fair price "because of their precarious financial situation."

Advocating public ownership of natural resources, Representative Amlie, Wisconsin, warned that coal, iron, oil, gas, forests and other natural resources, which are irreplaceable, are now being wasted by private competition.

FEDERAL HOUSING COSTS TOO HIGH, SAYS SENATOR

High cost of federal housing activities was attacked last week by Senator Holt, West Virginia.

Emphasizing he was not hostile to "efficient" federal housing operations, Holt charged the government already had put more than $7,000,000,000 in many forms of these activities and that average costs of the projects were higher than those of private homes in 36 states.

He said housing operations were benefiting the "few rather than the many," because poor tenants could not afford the rentals. He warned that the government must cease unbridled spending or all property valuations would be impaired.

He asserted housing projects of the public works administration had cost $1169 a room, or $4126 for a family dwelling unit, exclusive of the cost of sewerage and utility connections. Units of the Arthurdale, W. Va., homestead project cost an average of $15,343, he said.

WOULD MAKE WAGNER ACT APPLY TO ALL PURCHASES

A subcommittee of the house judiciary committee has voted to expand the Wagner act to every firm doing business with the government.

The proposed amendment would deny government contracts, loans or grants to companies which the labor board has ruled are violating the Wagner act. The amendment is supported by both the A. F. of L. and the CIO, but is opposed by the navy department and business organizations.

Navy spokesmen appearing before the subcommittee warned that disputes possible under the legislation might retard the armament program. They pointed to the difficulties faced last year when the navy was unable to get steel, due to the restrictions surrounding the award of federal contracts under the Walsh-Healey act.

There appears to be little chance of this bill being enacted into law during the present session.

FINESSE IN PRICES BEST ROAD TO TRADE SUCCESS

Dr. E. G. Nourse, director of economic research of the Brookings Institute, said, last week at a meeting of the trustees, that freedom of economic enterprise is essential to the nation's well-being.

Business, he said, must "serve the people of America in the fullest way permitted by our great resources. This means finding ways of supplying goods at prices people can pay and even accepting business at a loss in the short run for the sake of enlarged and sustained productivity in the long run. Business must show such skill in the finesse of pricing as to approach reasonably close to capacity operation."

As a contrast to the virtues of the "finesse stage" of operating the price system, Dr. Nourse warned against the "exploitation stage."

"The man who today tries to fence an industrial highway and exact an exorbitant toll from those who would travel the road to consumer satisfaction is in danger of defeating himself," he said. "Under modern conditions of technology, applied science is likely to find other methods of progress. The chemist will build a detour around him, the physicist will drive a tunnel under him, or a biological overpass will be devised."

The address took the form of a preliminary report on a study of industrial price policy just completed by Dr. Nourse and Dr. H. B. Drury.

Steel Must Get Truth of its Position Into Mind of the Man on the Street

■ "As a contribution to business in general, in the hope that it will help to stimulate recovery and add to public confidence, prevailing steel prices are herewith reaffirmed by the —?—?— Steel Co. for the third quarter.

"Unless there is a much greater immediate improvement in demand than now seems likely, this action definitely commits this company to unprofitable operations during the third quarter.

"This is because of sharp increases in costs. Taxes paid by the steel industry in 1937 were 62 per cent higher than in 1936. Wages paid by the industry are 31 per cent higher than in October of 1936. Other costs have risen correspondingly. The cost of replying to government questionnaires, and making tax and information returns, alone has become a staggering burden.

"Despite these increased costs, the steel prices now reaffirmed for third quarter are only 16 per cent higher than those that prevailed in October, 1936.

Abiding Faith in Future Only Justification for Price Action

"While the — ? — ? — Steel Co. has made much progress in offsetting the higher costs by developing more efficient practices, its justification for continuing current prices under current conditions is found only in an abiding faith in the future of this country and in a determination to contribute to national progress at this time by charging the lowest possible prices for its product."

Neither the above form, nor anything like it, was used by any steel company in announcing third quarter prices. It is set forth here entirely as suggesting a form that might have been used to explain effectively the true facts underlying steel prices.

For the general public's impression is that steel prices are too high; that the price policy of the industry is one of monopoly, and helped bring on the current depression.

Why does this impression prevail? Because many high government officials, economists, editorial writers, labor leaders and others who influence public opinion set forth distorted facts about the industry.

Skill in Feeling Public Pulse Needed in Steel Announcements

It prevails because the industry is doing very little to correct the public impression. It prevails because few of the industry's spokesmen know how to address themselves favorably to the "man in the street."

Steel prices are of interest to the nation. Therefore, announcements hereafter should be addressed not only to the trade but to the general public.

Given the facts, any tyro journalist could have written a better third quarter price announcement than was issued by some of the steel companies. Production men, salesmen, lawyers, accountants have their place in the steel industry. All of them can make important contributions to an overall public relations job. Theirs, however, is not the skill that is required in addressing the public. It is high time that responsibility for addressing the public be entrusted to men who are skilled in this art.

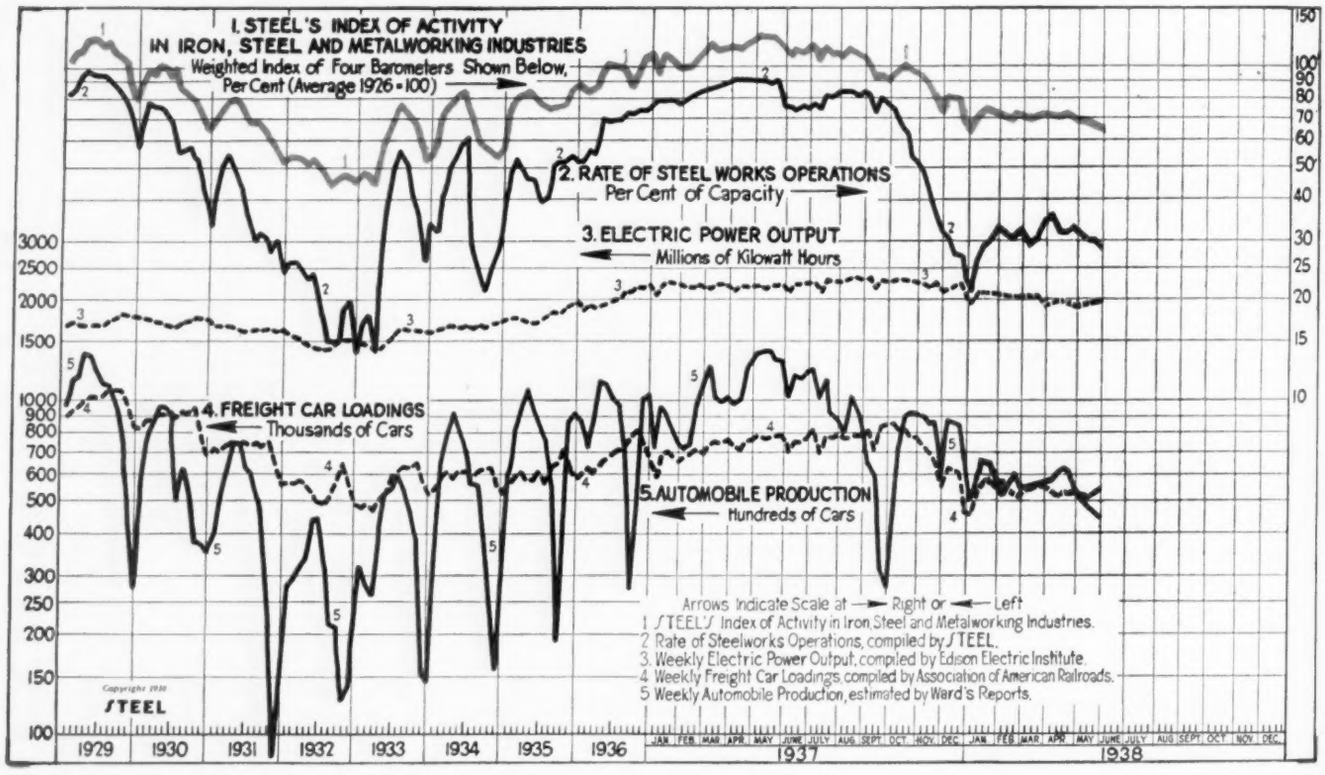
Activity Index Drifts to Lower Levels

■ BUSINESS records in recent weeks indicate that industrial activity has been maintained at a fairly steady pace but at a somewhat lower level than in April. Thus the first week of June has been reached without exhibiting signs of new demand in sufficient volume to halt the seasonal decline in industrial activity.

Due to this sluggishness in the iron, steel and metalworking industries, STEEL'S index receded to 66.2 per cent in the week ended May 28. This recent decline of 0.9 point forced the index into new low levels for this year. It now stands at approximately 43 per cent below the comparable week a year ago. The moderate decline in STEEL'S index in the week ended May 28 reflects the disappointing reports for two out of four of the business indicators from which the index is composed. The rate of steelmaking operations eased 1.5 points to 28.5 per cent. This is the lowest steel rate since the week ended Jan. 8 and there are indications it will go still lower in the week ended June 4 due to holiday interruptions.

Automobile assemblies declined less than seasonally in the week ended May 28 to 45,210 units. However the present level of production is approximately 66 per cent lower than a year ago. The outlook for this industry through the remainder of the second quarter is not encouraging with possible still lower operations in prospect.

Revenue freight car loadings and electric power output have shown slight tendencies toward improvement in recent weeks, although both barometers remain appreciably below corresponding figures for 1937.


1. STEEL'S INDEX OF ACTIVITY
IN IRON, STEEL AND METALWORKING INDUSTRIES
Weighted Index of Four Barometers Shown Below,
Per Cent (Average 1926-100)
2. RATE OF STEEL WORKS OPERATIONS
Per Cent of Capacity
3. ELECTRIC POWER OUTPUT
Millions of Kilowatt Hours
4. FREIGHT CAR LOADINGS
Thousands of Cars
5. AUTOMOBILE PRODUCTION
Hundreds of Cars
Arrows Indicate Scale at → Right or ← Left
1 STEEL'S Index of Activity in Iron, Steel and Metalworking Industries.
2 Rate of Steelworks Operations, compiled by STEEL.
3 Weekly Electric Power Output, compiled by Edison Electric Institute.
4 Weekly Freight Car Loadings, compiled by Association of American Railroads.
5 Weekly Automobile Production, estimated by Ward's Reports.
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1929 1930 1931 1932 1933 1934 1935 1936 1937 1938

STEEL'S index of activity declined 0.9 points to 66.2 per cent in the week ended May 28:

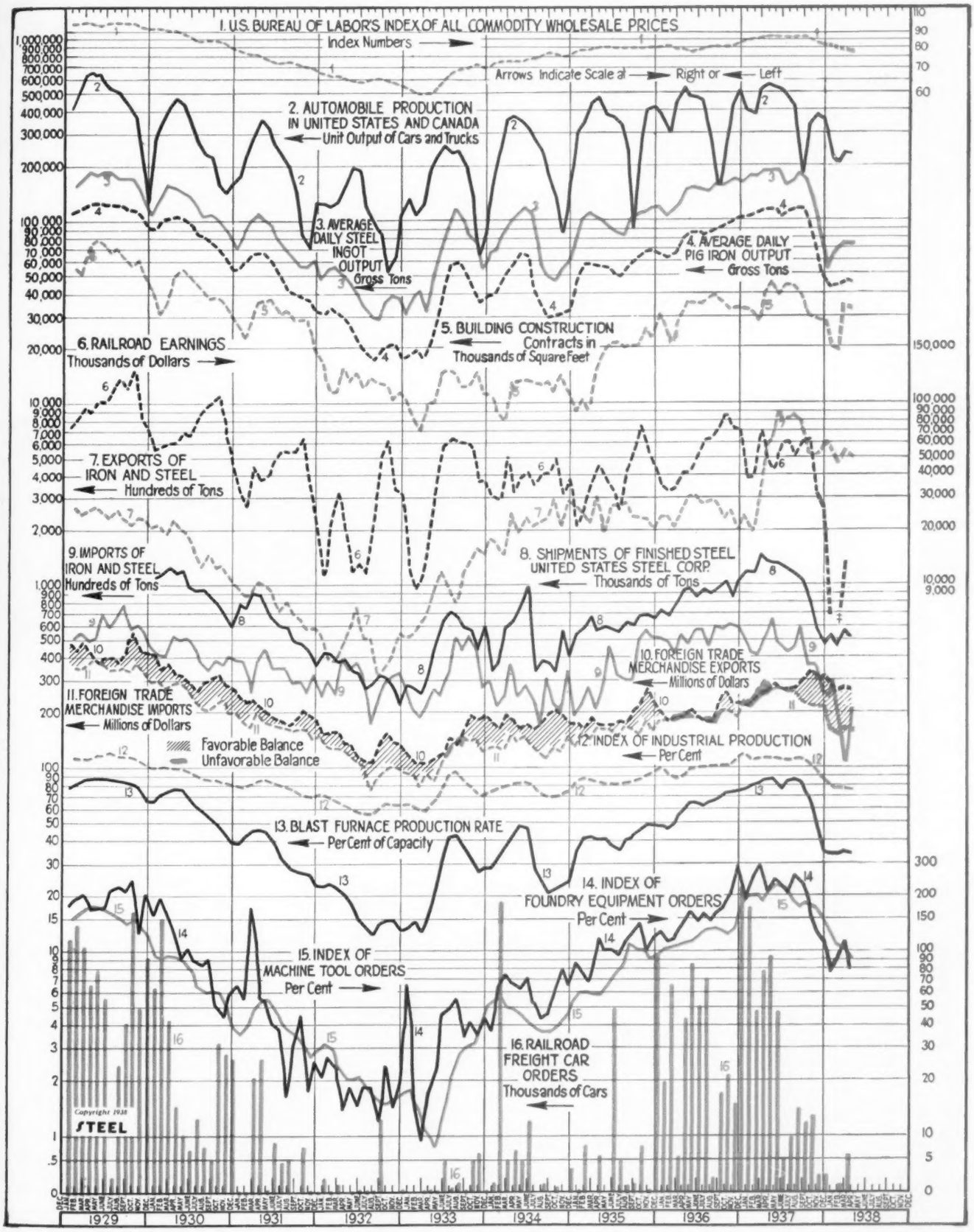
Week ending	STEEL'S Index of Activity Index No. 1938	1937	Steelworks Operating Rate Per Cent 1938	1937	Electric Power Output Million KWH 1938	1937	Freight Car Loadings 1938	1937	Weekly Auto Output 1938	1937
Feb. 26	70.3	112.8	30.5	84.0	2,031	2,207	511,930	696,727	56,977	111,915
Mar. 5	70.1	117.9	29.5	86.0	2,035	2,199	552,916	734,127	54,440	126,975
Mar. 12	70.8	112.7	30.0	87.0	2,014	2,212	556,664	748,993	57,438	101,684
Mar. 19	71.3	113.1	32.0	89.0	2,017	2,211	540,332	759,269	57,555	99,013
Mar. 26	72.4	114.0	35.0	90.0	1,975	2,200	572,952	761,109	56,800	101,046
Apr. 2	72.0	112.0	36.0	91.5	1,978	2,146	523,489	726,687	57,500	97,005
Apr. 9	71.3	112.8	32.0	91.5	1,990	2,176	521,978	716,044	60,975	99,196
Apr. 16	71.4	119.6	32.0	91.5	1,957	2,173	537,595	751,328	62,021	125,472
Apr. 23	70.8	122.0	32.5	91.5	1,951	2,188	523,767	761,182	60,563	133,164
Apr. 30	68.4	123.9	32.0	91.0	1,938	2,193	543,075	782,423	50,755	139,475
May 7	68.5	123.5	31.0	91.0	1,939	2,176	536,140	767,481	53,385	140,188
May 14	67.2	123.2	30.0	89.0	1,967	2,194	541,813	773,669	47,415	140,396
May 21	67.1	122.2	30.0	91.5	1,967	2,198	545,808†	779,276	46,810	131,306
May 28	66.2*	115.6	28.5	75.0	1,973	2,206	548,537*	794,855	45,120	131,421

*Preliminary. †Revised.

STREND

Key:	April, 1938	Key:	April, 1938	Key:	April, 1938	Key:	April, 1938
1	78.7	5	32,569,000	9	21,237	13	33.4
2	238,133	6	*14,470,444‡	10	274,482,000	14	79.3
3	74,045	7	489,202	11	159,907,000	15	91.0
4	46,267	8	501,972	12	77.0	16	15

*March. ‡Deficit of $2,136,481 in February not shown on chart.



Key: 1. U. S. Bureau of Labor's Index of all Commodity Wholesale Prices. 2. Automobile Production in United States and Canada, compiled by U. S. Department of Commerce. 3. Average Daily Steel Ingot Output, compiled by American Iron and Steel Institute. 4. Average Daily Pig Iron Output, compiled by STEEL. 5. Building Construction, Contract Awards in 37 States, compiled by F. W. Dodge Corp. 6. Railroad Earnings, Net Operating Income for Class I Roads, compiled by Bureau of Railroad Economics. 7 and 9. Iron and Steel Foreign Trade, reported by Bureau of Foreign and Domestic Commerce. 8. Shipments of Finished Steel, United States Steel Corp. 10 and 11. Foreign Trade, Value of Exports and Imports, reported by Bureau of Foreign and Domestic Commerce. 12. Index of Industrial Production (adjusted for seasonal variation; average 1923-25=100) computed by Federal Reserve Board. 13. Blast Furnace Production Rate, compiled by STEEL. 14. Index of Foundry Equipment Orders (Average 1922-24=100), compiled by American Foundry Equipment association. 15. Index of Machine Tool Orders (Three-month moving average; average monthly shipments 1926=100), compiled by National Machine Tool Builders association. 16. Railroad Freight Car Orders, compiled by STEEL.

Machine Tools

Manufacturing operations in machine tool building plants differ from ordinary production machine shop routine because such tools are not built in quantities

By FRED B. JACOBS

■ MANUFACTURING operations in machine tool building plants differ in one respect from ordinary production machine shop routine since machine tools are seldom built in large quantities.

For this reason much of the work must be done without jigs and special tools, and this factor necessitates the services of skilled mechanics. Illustrating this fact are some typical machining operations at the plant of the Cone Automatic Machine Co. Inc., Windsor, Vt., in the manufacture of automatic screw machines. Intricate nature of these machines is apparent from the close-up view of part of the operating mechanism shown in Fig. 1, showing tool slide, tool holders, spindles and cross tools of an 8-spindle machine.

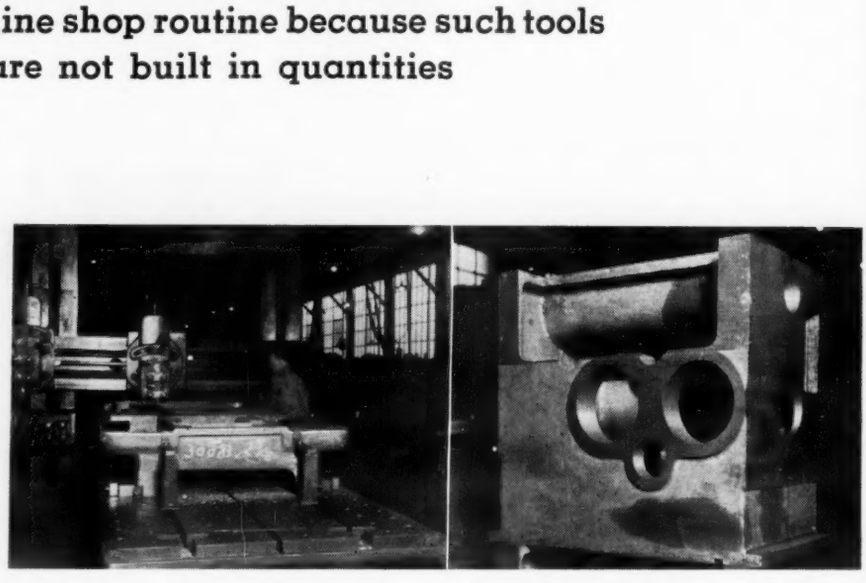


Fig. 2 (Left)—Planing and automatic screw machine bed 101¾ x 54 inches. The planer does jobs that can be done in no other way

Fig. 3 (Right)—Gear box is planed on all six sides, and holes are precision bored on a horizontal mill, deriving location from slot in bottom

In practically any machine tool building plant will be found accurate planer work such as shown in Fig. 2. This planer accommodates work 68 inches between the housings. The job consists of finishing an automatic screw machine bed 101¾ inches long and 54 inches wide. Work is aligned and strapped to the platen in the usual way, while planing consists of finishing several flat surfaces and also planing slots to accommodate aligning blocks. As shown, the machinist is planing a short surface below the level of the bed. It sometimes is claimed that planing is a slow process due to time lost on each return stroke. Be this as it may, there is no end to jobs in the machine tool building plant which cannot be finished in any other way.

A good example of accurate planer work followed by precision boring is given in Fig. 3. This unit is a gear box, 25 x 25 x 16½ inches.

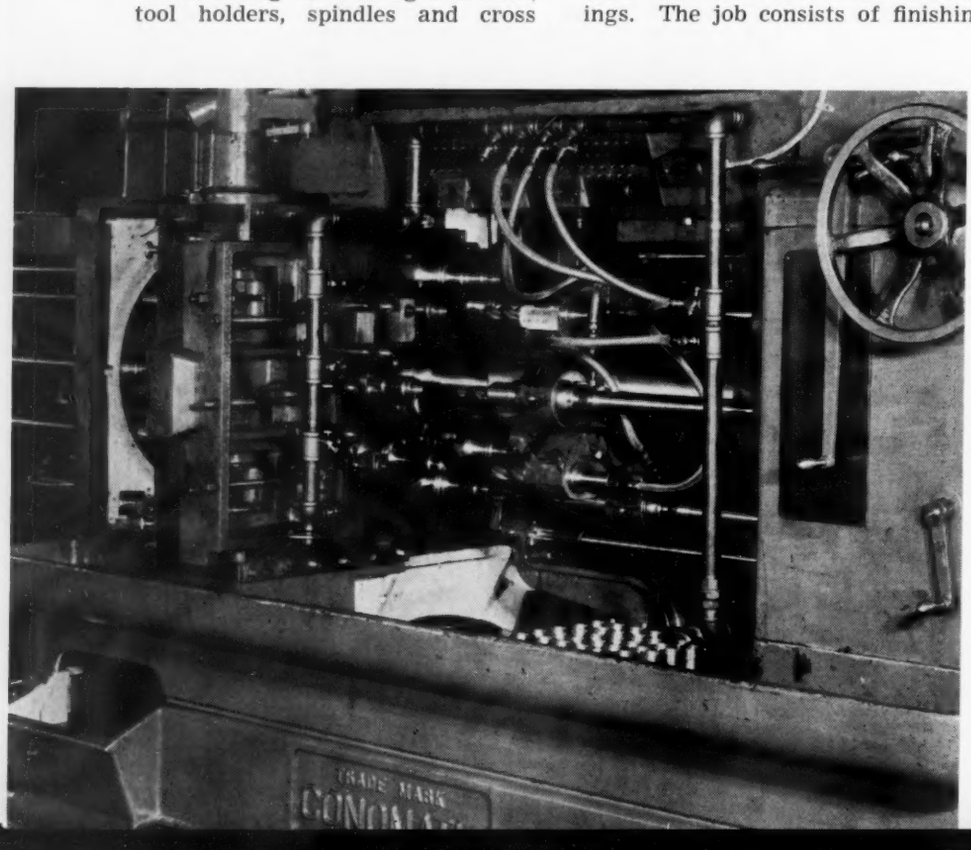


Fig. 1—A view of tool slide, tool holders, spindles and cross tools of an 8-spindle, automatic screw machine

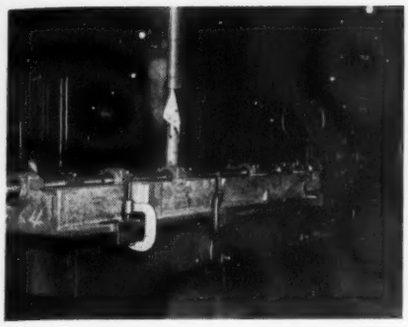


Fig. 4—Precision boring a cast iron top bed for an 8-spindle machine; a jig is used and the bored holes are in close alignment

It is planed on all six sides and, due to the nature of the work, it is a simple procedure to strap several to the planer platen at one setting. At right bottom is shown a slot; the three holes on the face of this part get their location from this slot. This work is done on a horizontal boring mill, the micrometer dials being relied on to get the correct spacings. The two holes shown on the face at the right also are finished on the horizontal boring mill, the location being from the bottom and the front surface.

In Fig. 4 is shown a precision boring operation wherein the work is located in a jig. This part is a cast iron top bed for a 1¼ inch, 8 spindle machine, and is 9 feet long. In the boring operation five 3½-inch holes are bored to accommodate bronze bushings. The part locates over a boring jig which rests on the machine platen. This jig is provided with four bushings through which the boring bar runs. Finished in this manner, assurance is had that the bored holes will be in close alignment; the more accurately the parts are bored, the less scraping and fitting are necessary in the final assembly.

In some types of machines made at this plant the holes in the top bed are babbitted in a jig somewhat similar to the one shown in Fig. 4 and after babbitting, the holes are scraped to true bearings.

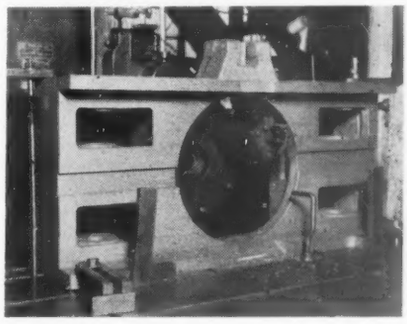


Fig. 5—Horizontal boring mill is used in taper boring front support, a part too heavy to swing on the table of an ordinary vertical boring mill

A taper boring operation on a front support is shown in Fig. 5. Formerly this part was finished by planing. The machine used is a horizontal boring mill and, as the illustration shows, the work is strapped directly to the platen. The hole is 19 inches in diameter bored to a 14-degree included angle. Boring is accomplished by the boring head shown. This is provided with a screw feed, the head being actuated by the star wheel at the front which strikes the support on the platen at each revolution thus turning the screw 1/6 of a revolution.

The boring operation shown in Fig. 6 is a good example of work done without the aid of special tools. This part is a turret revolving head in which four clearance holes are bored, equally spaced about the center. These holes are for clearance only and are 4¼ inches in diameter. The machine used is a horizontal boring mill. The work is clamped to an angle iron which in turn is bolted to the machine platen. The four sets of two guides each shown in the illustration, are for the purpose of actuating the turret mechanism.

(*Please turn to Page* 75)

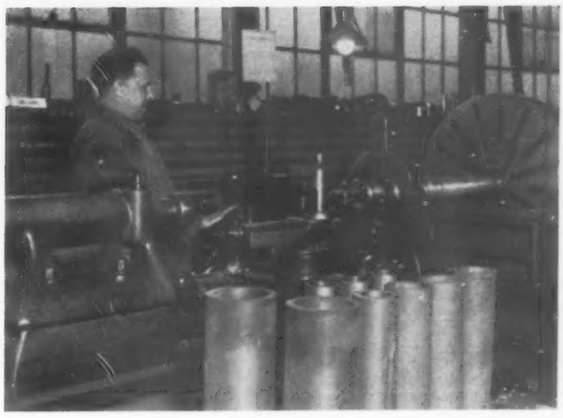
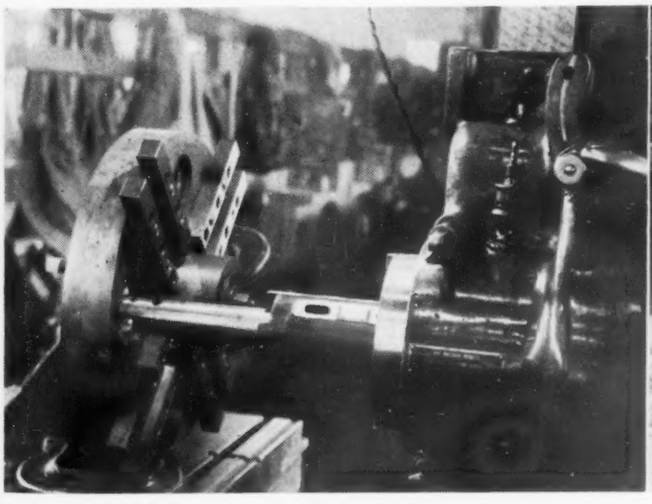
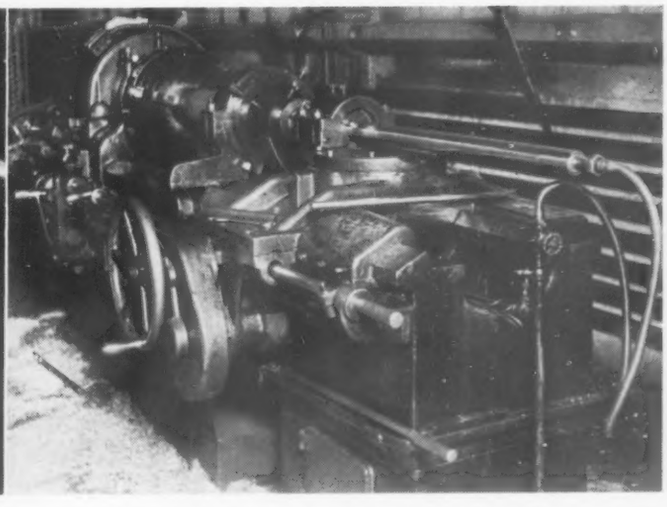


Fig. 8—A large amount of engine lathe work also is involved; here is shown the boring of a taper seat in a spindle end

Fig. 6—The horizontal boring mill also is used for boring four clearance holes in a turret revolving head, rendering special tools unnecessary

Fig. 7—Spindles are bored with a hog-nose drill mounted in a turret lathe in which the turret is replaced by a support which carries the drill





Basic Similarity in Foundry Cost Systems Suggests Standardization

Melting Costs

■ FOUR papers on melting costs were presented at a management session on costs. The subject was introduced by A. E. Grover, cost consultant, Berea, O., who confined his attention to melting costs in nonferrous foundries. Melted metal costs include cost of metal and melting expense, the latter being divided into costs of doing business, fixed overhead and operating overhead. Labor in unloading, sorting and storing as well as sampling and analysis expense is included. Shrinkage of not less than 5 per cent of metal value is included.

Items such as income tax, development expense, inoperative plant and unabsorbed overhead come out of apparent profits and are not figured as cost items. However, fixed overhead such as rent, depreciation, sales expense and advertising are prorated and included in costs in addition to operating-overhead items such as plant supervision, fuel and power, compensation insurance, and laboratory expense, also prorated to the melting department.

Mr. Grover pointed out that actual production costs for any month are not so important as to know how much they were above or below normal costs. In answer to why figure overhead costs in connection with melting department, it was brought out that this was necessary to estimate jobs properly and that if not included costs are fictitious and low yield castings are sold at a loss. However, in latter discussion, it was pointed out that other methods used included overhead as a percentage addition, roughly 10 per cent, figured on end of estimated costs.

Diversity Complicates Costs

While melting cost per pound can be figured by dividing total costs by total pounds over a year's time, this only applies in foundries producing one metal. Where two or more metals are produced, costs must be weighted as they usually are not the same for different metals.

Questioned as to whether interest on equipment investment was included in overhead, Mr. Grover called attention to fact that few authorities agree on this, no allowance being permitted on this item in figuring income tax. However, this is being included as a direct cost by some plants and figured in the profit account which appears to be approved by federal experts.

Mr. Grover also pointed out that over or underabsorbed overheads are taken care of by putting difference between actual overhead and absorbed overhead in the profit and loss account.

The second paper on calculating the cost of steel in castings was prepared by W. J. Corbett, Atlas Steel Casting Co., Buffalo, N. Y. Due to wide variation, importance of determining yield accurately was strongly emphasized. Yield here represented percentage of total metal charged into furnace that results in good castings. Some other cost men figure it as percentage of total metal poured that results in good castings and take care of loss in the furnace by other means.

Considers Malleable System

R. E. Belt, Malleable Founders' Society, Cleveland, presented the third paper on melting costs in malleable iron foundries. Yield was recognized as the principal factor in giving truer metal costs. Sales, advertising and overhead expenses are included here by adding about 10 per cent to total price to get ultimate price of a job. He brought out that conversion costs in malleable iron practice include plant fixed charges and oxidation and metal loss, whereas steel plant practice does not.

Fourth paper on gray iron melting costs, by P. E. Rentschler, Hamilton Foundry & Machine Co., Wauwatosa, Wis., pointed out that gray iron practice included all overhead items such as light, power, maintenance, advertising and selling, prorated and charged against the melting department.

Sam Tour, Lucius Pitkin Inc., New York, called attention to basic similarity of all four systems with possible exception of method of handling overhead items. He believed it possible to make a composite system, or uniform melting costs system, although there is no proposed A.F.A. cost system being advocated or contemplated. Mr. Tour, who was presiding as chairman of the session, stated that molding costs probably would be the subject of next year's cost session.

HEREWITH is concluded STEEL'S report of important sessions held in connection with the forty-second annual convention of the American Foundrymen's association in Cleveland, May 14-19. Proceedings at a number of other sessions were reviewed in the issues of May 23 and May 30

Safety and Hygiene

■ Silicosis provided the chief topic for discussion at the safety and hygiene session. In his remarks as chairman, Bert Ballard, General Electric Co., West Lynn, Mass., asserted the public has gained the impression through lack of reliable information that foundry operations are subject to serious hazards which menace health of workers. From long experience, he knew this not to be true and hailed any effort to disemminate accurate information.

Presenting a paper on silicosis in the foundry, Dr. Leonard Greenburg, executive director, division of industrial hygiene, department of labor, State of New York, said a recently completed survey conducted in foundries of New York state, involving over 4500 employes in approximately one-third of the foundries, and which constituted a comparable cross section of all types and sizes of foundries, showed that only 2.4 per cent of employes in all classifications exhibited silicosis. For those directly concerned with foundry operations, the rate was slightly higher, namely 2.7 per cent.

Foundry Rate Varies Little

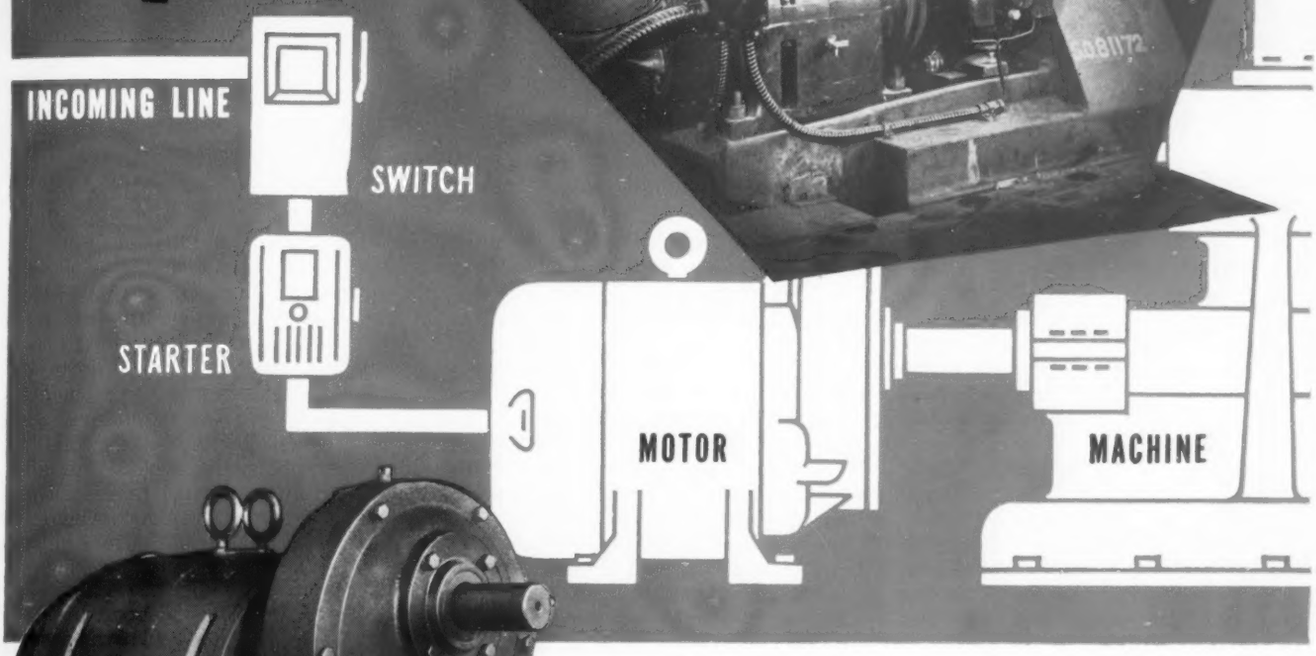
Of foundry workers alone, 4.5 per cent showed indications of fibrosis with and without silicosis. Dr. Greenburg pointed out that the degrees of fibrosis and silicosis will depend on the length of exposure to dust, and that in the survey 2.2 per cent of foundry workers exhibited first stage silicosis; 0.4 per cent, second stage, and 0.1 per cent showed third stage silicosis. He stated that the statistics obtained indicated there was little difference in figures obtained from different branches of foundries; steel foundry workers showing about 1 per cent more fibrosis and silicosis than other types of foundries.

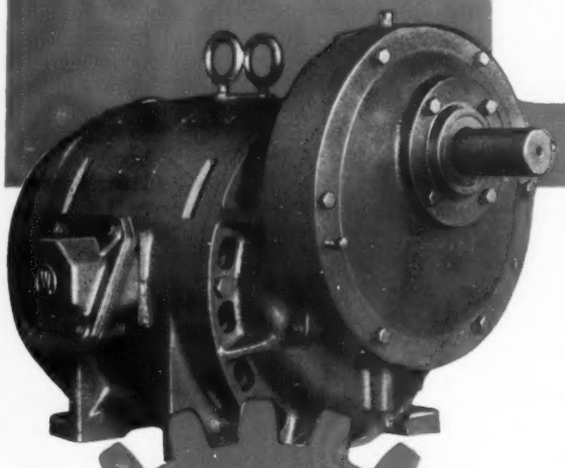
The speaker said the survey clearly indicated that the foundries showed no serious hazard as far as dust exposure was concerned, and what little hazard there was could be cured by a simple straight-forward attack.

The paper was discussed by Dr. J. H. Chivers, Crane Co., Chicago, who stated that the data presented confirmed similar information he had compiled. He said the comparatively small dust hazard existing in

(Please turn to Page 75)

SIX SAVINGS may be made HERE





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Motors geared direct to the driven machine, delivering the required power and required rpm are the simple efficient and modern method of power transmission.

They do not require complicated hook-ups, cost less to install, require less space, save in maintenance, save shutdowns, save accidents, and increase the efficiency of power transmission to from 94 to 96%.

For both economy in installation and operation, it will pay you to get the facts about modern geared drives. Ask Westinghouse not only foremost in the development of the electric motor, but builders of precision gears for over 50 years. Your nearest Westinghouse office will be glad to give you the facts. Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

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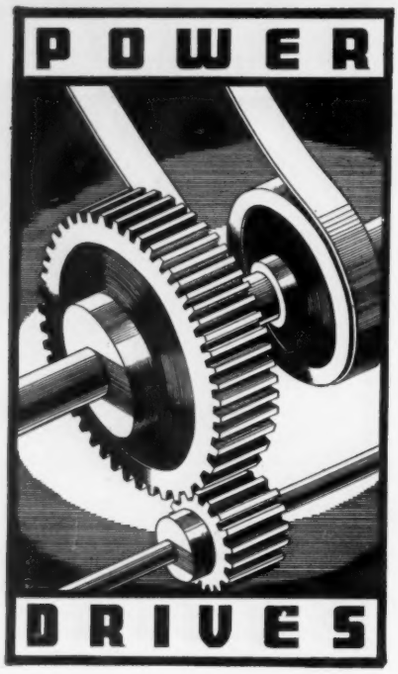


Finding True Costs

First cost plus upkeep is not true cost of a power drive as output must be taken into consideration. Actual figure proves to be cost per unit of goods manufactured

■ IN THE PURCHASE of power drives, as in the purchase of any other item of industrial production equipment, the true cost is the cost per unit manufactured. Comparisons of purchase price alone do not give a true picture of actual cost.

One item which originally costs twice as much as another may show three or four times as much production during its operating life. If a drive, it may provide increased production per hour on an expensive machine, with less interruption as well as longer life. In such cases comparisons of first cost also give false impressions.

In answering the question, "Just what does an operating man expect of a transmission belt?" the editor of *The Houghton Line,* published by E. F. Houghton & Co., Philadelphia, states consensus of engineering opinion shows that in the final analysis operating men want a lower ultimate operating cost. Discussing this further he says: "To compute the cost of a belt upon operating hours did not present the true picture. Two belts may each run the same length of time, yet one may produce 5 per cent more units than the other, perhaps because the latter slipped badly, reducing the delivered power.

"The total cost of a belt includes the original price, maintenance and repairs when necessary. To arrive at cost per unit produced, we should use the yardstick of output. That idea is not original with us; large plants who break down unit costs to seven and eight decimal places have studied transmission costs and compared them down to hundred thousandths of a cent per finished unit per machine.

"We do not expect that the average man operating a small or middle-sized plant will go to such extremes to keep accurate belt costs. But we do know that in a time like this, when the costs of doing business continue to rise and sales volume seems to resist soaring, there is a narrow road between these two which leads to profits. This road, unfortunately, has plenty of obstacles and it becomes necessary to survey it, making also a careful study of the terrain over which we have passed.

Depends on Fine Points

"For example a certain company which forwarded us a cost card showing that one small part of an automotive transmission cost $0.00000025 per foot (of belt) per unit produced, per year. That's getting down to pretty fine points, but the profit margin depends upon knowing what those fine points are. A good cost analysis in the case just cited enabled average costs to be lowered to three-eighths of former values.

"Steel mills rate their belting on a tonnage basis. They have been able to raise the apparent maximum from 150,000 to 250,000 tons per belt in a single rod mill merely by standardizing on a first-quality leather belt."

Additional cases cited in this article show where a 25 per cent additional first cost of a belt gave

(*Please turn to Page* 76)

Cooling Unit Is Portable

■ **Built by Norge division, Borg-Warner Corp., Detroit, this portable cooling unit for home or office use delivers 200 cubic feet of cooled, dehumidified and properly cleaned air per minute into a room at suitable air velocities to produce draftless ventilation**

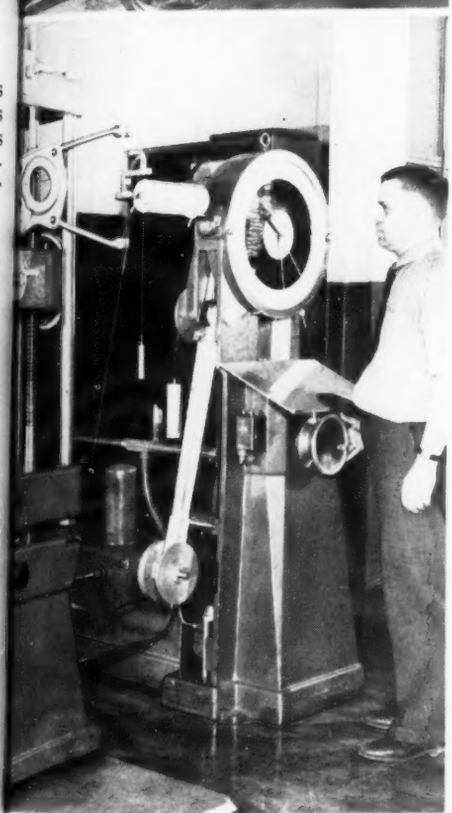
A Modern Laboratory

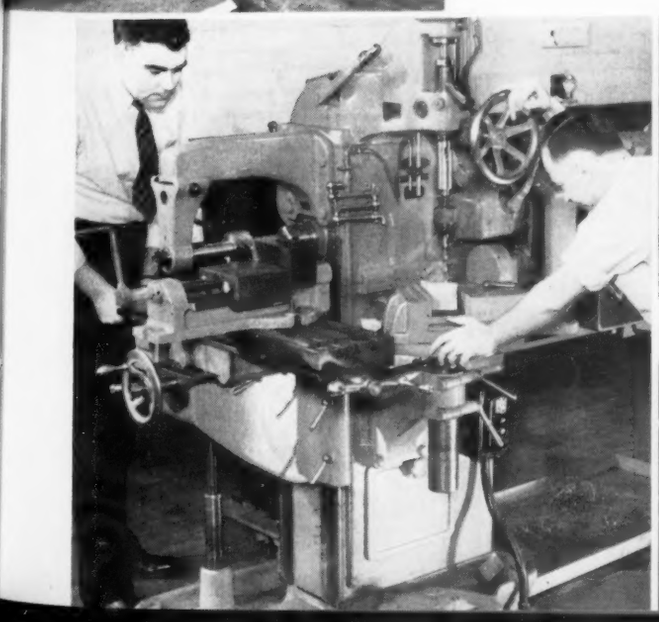
The Watchdog of Industry

■ A MODERN LABORATORY is the plant watchdog over quality of raw materials and finished product. The automobile industry recognizes its importance as evidenced by the accompanying illustrations which show parts of the relocated, reorganized and modernized laboratories at Buick Motor division of General Motors Corp., Flint, Mich. Heading this investigating division is the metallurgical department, in charge of R. B. Schenck, under which come five functional branches . . . . a specification division which issues all materials and process specifications; a metallurgical division, responsible through contact men in each of the principal manufacturing department for inspection and sampling of raw materials and finished products; a furnace division which controls operation of all heat treating equipment; a physical testing division handling mechanical and metallographic tests; and a chemical division which deals with all problems of chemical analysis and electrochemical solutions and also supervises salt spray tests on coatings.

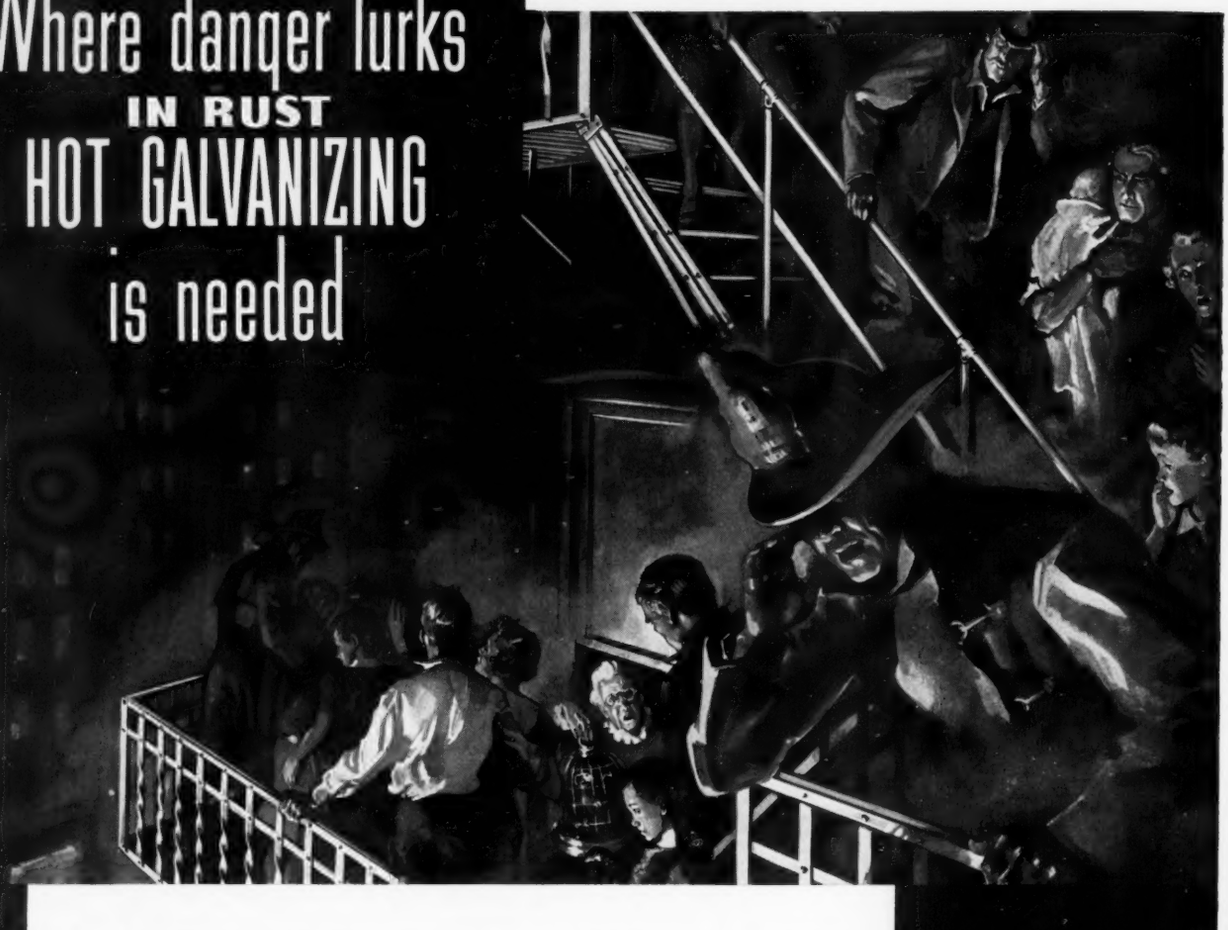
\+ + +

Top view shows general layout of various testing stands in the laboratory. Upper left, a new type Vickers-Armstrong machine is making a hardness test using a diamond point to make an impression subsequently gaged by microscopic sights. At left, a hydraulic tensile machine of 60,000-pound capacity is measuring strength of a butt weld on a knee-action A-frame or lower control arm. Lower left shows a four-in-one universal sampling machine used to prepare metal test specimens. Below at right, a propeller shaft is being twisted in this 300,000-inch-pound torsion testing machine, claimed to be one of largest in the industry.





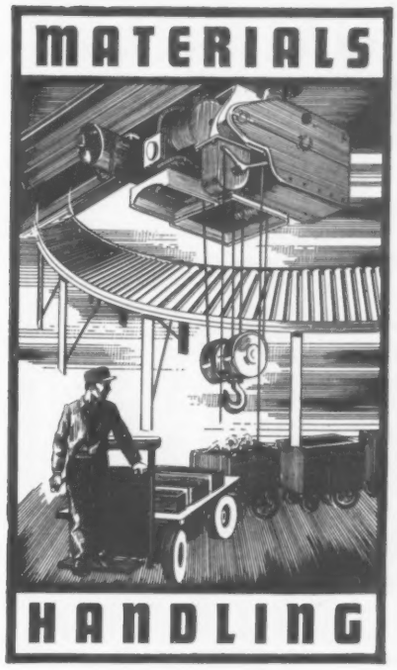
Where danger lurks IN RUST HOT GALVANIZING is needed



Rust does its greatest damage in nooks and crannies where painters can't reach, where inspectors cannot see, in vital spots where metal failure means disaster . . . The most practical and economical rust preventive known to modern science is Hot Dip Galvanizing because in the hot dipping process, the molten zinc flows into and fills every crevice and leaves an even coating of approximately two and one-half ounces of zinc on every square foot of surface . . . A coating that is constantly demonstrating its greater durability per dollar . . . Buy from the qualified members of this Association listed below and know that you are getting a quality hot dip job every time . . . American Hot Dip Galvanizers Assn., Inc., American Bank Bldg., Pittsburgh, Pa.

IF IT CARRIES THIS SEAL IT'S A JOB WELL DONE

Acme Galvanizing, Inc., Milwaukee, Wis.
Acme Steel & Malleable Iron Works, Buffalo, N. Y.
American Tinning & Galvanizing Co., Erie, Pa.
Atlantic Stamping Co., Rochester, N. Y.
Buffalo Galvanizing & Tinning Wks., Inc., Buffalo, N.Y.
Columbian Steel Tank Company, Kansas City, Mo.
Diamond Expansion Bolt Co., Inc., Garwood, N. J.
Enterprise Galvanizing Co., Philadelphia, Pa.
The Fanner Mfg. Company, Cleveland, Ohio
John Finn Metal Works, San Francisco, Cal.
Thomas Gregory Galvanizing Works, Maspeth, N. Y.
Hanlon-Gregory Galvanizing Co., Pittsburgh, Pa.
The Hodell Chain Company, Cleveland, Ohio
Independent Galvanizing Co., Newark, N. J.
International Derrick & Equipment Co., Columbus, Ohio
Joslyn Co. of California, Los Angeles, Cal.
Joslyn Mfg. & Supply Co., Chicago, Ill.
L. O. Koven & Brother, Inc., Jersey City, N. J.
Lehigh Structural Steel Co., Allentown, Pa.
Missouri Rolling Mill Corp., St. Louis, Mo.
The National Telephone Supply Co., Cleveland, Ohio
Penn Galvanizing Co., Philadelphia, Pa.
Riverside Foundry & Galvanizing Co., Kalamazoo, Mich.
San Francisco Galvanizing Works, San Francisco, Cal.
The Sanitary Tinning Co., Cleveland, Ohio
Standard Galvanizing Co., Chicago, Ill.
Wilcox, Crittenden & Co., Inc., Middletown, Conn.
The Witt Cornice Co., Cincinnati, Ohio



Dual-Use Box Skids

System providing ample storage space in new assembly building eliminates much expensive rehandling both in unloading areas and in the various departments throughout tractor plant

J. A. CRONIN, Materials Handling Editor

■ HANDLING at the Springfield, Ill., plant of Allis-Chalmers Mfg. Co. may be divided into four classifications; receiving and storing, work in process, yard haulage, and handling in assembly. Making gasoline and oil-engine driven crawler-type tractors, standard parts more or less common to entire line are purchased elsewhere or received from other divisions of the company. Other parts are fabricated at this plant. There are three main buildings located on a 142-acre plot.

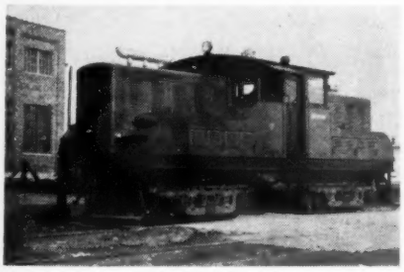


Fig. 1—Electric locomotive uses two 120-horsepower oil engines and interconnected generators. It switches and transfers cars between plant buildings

Yard receiving and storage is placed between main shop and new assembly building, where space is provided for future expansion.

Switch connections with three railroads simplify receiving and shipping. Incoming lines and plant buildings are connected by plant owned and maintained tracks so cars may be switched to any location within the plant, and returned to the tracks of any of the three lines. An oil-electric locomotive, Fig. 1, used for yard switching has two generators which are interconnected and synchronized so both may be operated together or either singly. This locomotive has pulled a line of 35 loaded cars.

One switch track extends along open yard storage with an unloading platform along one side and open storage on the other. This is used for handling heavy castings and forgings, structural shapes, round, square or flat bar and tubular stock. Cars are unloaded by a gas-powered crane with capacity of 3 tons with its 30-foot boom extended and 10 to 15 tons with boom vertical.

Steel from yard storage is distributed on tractor-drawn trailers as yard is not all paved. Trailer wagon has a platform, 9 x 22 feet, built on a welded frame of 8-inch extra-heavy steel tubing and with a maximum capacity of approximately 10 tons. Distances hauled vary from 600 to 1200 feet. Yard storage material also is reloaded on flat cars owned by the company and distributed by the electric locomotive.

Each building is provided with two or more inside unloading docks with depressed tracks for receiving carloads of small castings, forgings, cut stock, finished parts or other material which requires protection from the weather. All unloading docks have overhead traveling crane service.

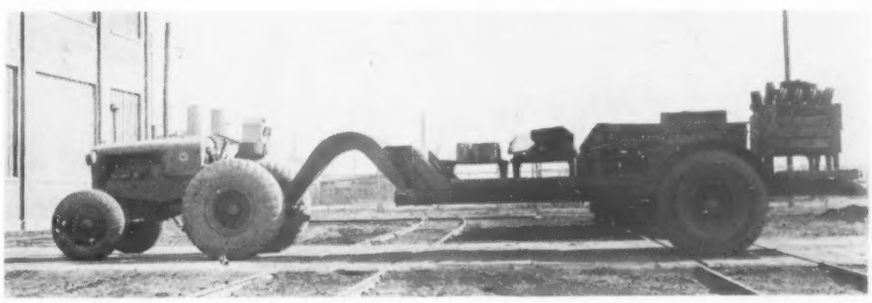


Fig. 2—Yard hauling and rush transfer of skid loads are handled on this modified wagon trailer unit

Material Distributed

Incoming material is placed on lift truck platform or box skids, provided with hook and eye attachments for hoisting out of the gondola by crane to loading platform where the skids are picked up by gas-electric lift trucks for distribution. Considerable space is available for floor storage of these box skids so that seldom is it necessary to unload them until placed in production. When processed, parts are placed again in box skids for temporary storage or assembly.

Two sizes of box skids are standardized for production work, the majority being on 3 x 4-foot platforms with removable wooden sides or box sections 1 foot high. These sections are provided with steel corner clamps which lock into the platform and into each other. Boxes are limited to three sections high giving a capacity of 36 cubic feet, or approximately 6000 pounds per

load. The other standard box skid is built on a 3 x 6-foot platform and is limited to two sections high, thus providing the same maximum capacity. These larger boxes are used for longer or bulkier parts. Lift trucks have either 4 or 6-foot platforms, and are of 6000 pounds capacity.

When special loads are to be moved, skid boxes are loaded by crane on the platform of a two-wheeled yard trailer, Fig. 2, for transfering between manufacturing and storage or assembly buildings. Usually, finished parts are loaded on the company's flat cars and switched across the yard to storage or assembly departments. These cars and locomotives are painted orange and never leave the yard. Depressed tracks permit loading by electric trucks or crane.

Special Designs

Some box skid platforms are designed for special purposes. For example, scrap and turnings are loaded in steel boxes with one end hinged, to be dumped into the gondola by crane. These are handled to and from cars by lift truck. Another interesting box is for rejected material. It is provided with a lock so rejected parts cannot be removed, and may not be scrapped except by the properly authorized inspection department.

Sweepings, waste paper and lunch boxes are dumped into a large skid box with sheet metal sides and a hinged top and hauled away at night for disposal. At points where large quantities of gas and oxygen are used for welding, a box skid filled with cylinders on end is taken to the welder. These cylinders are connected to a manifold so operator can change quickly from one to another without rehandling cylinders.

Every effort is made to use standard box skids, with few special units. Also, work in process is handled into and out of box skids, except where work passes through several machines in a straight line continuous operation.

Track shoes, however, are handled in straight line production through a five-machine line. At first press, special rolled steel bar stock is sheared to length. Sheared end drops on a short roller conveyor, which carries it to another press used to trim corners. Shoe then has clearance notches punched. A storage conveyor carries shoes between two multiple drill presses for drilling bolt holes, the arrangement making the shoes available to either operator. Finished shoes are piled in a box skid for transfer to assembly line.

To obtain the necessary drop between various units, the three presses are mounted on built-up welded bases of different heights so each is a little higher than next in line.

Floor space in new building, 290 x 750 feet, is apportioned as follows: 30 per cent to storage, 45 per cent to assembly, and the remaining 25 per cent to painting, testing and shipping. It includes four depressed switch tracks, one at each corner, with space for 16 cars. These tracks do not extend the full length of the building. Two tracks at north end, facing the manufacturing building, are used for incoming material; shipments are made from the opposite end.

Truck pits, one with truck scale, also are placed in each corner of building. The east and west bays are each served by two overhead traveling cranes, 5-ton capacity at incoming or north end and 15-ton at shipping end where completed tractors are handled.

Material as received in the new building is unloaded into skid boxes or platforms and stored with boxes of parts from the other building until needed at point of assembly. About one-third the floor space is utilized for temporary storage of incoming material. This eliminates expensive rehandling and also permits instant access to any material or part as needed. Some small parts are stored in steel bins or shelves to conserve space. Larger parts generally remain in skid box until they are used.

Started on Dolly

Transmission assembly is started on a 4-wheeled dolly on a floor track, pushed along as work progresses. Subassemblies are made in an adjacent bay, lifted and swung over to main assembly by jib cranes with electric hoists, or moved across by a fixed tramrail with hoist.

Before putting engine in chassis, an electric motor on a jib crane is swung into position on partially assembled tractor to test gear shift, gears and bearings. Any adjustments may be made without removing the heavier engine as might be necessary if installed first.

On line assembly numerous bolts, nuts and small parts are placed in steel boxes on a rack, suspended from a tramrail trolley which rides on I-beam trolleys at ends so trays of bolts may be moved along line of work or to the side. When the assembler needs them, he pulls the tray over to him; when through, he pushes it back out of his way. This arrangement is shown in Fig. 3. Air motors and impact wrenches for tightening bolts and nuts are spring suspended from an overhead trolley. When operator releases tool, it is lifted out of his way by the spring. These trolleys are mounted on two movable I-beams set so tool and trolley may be moved in any direction.

Crawler track is assembled in bays between pairs of main assembly lines. Here track shoes are bolted to track chain with a high-frequency impact nut setter. Pins

(*Please turn to page* 76)

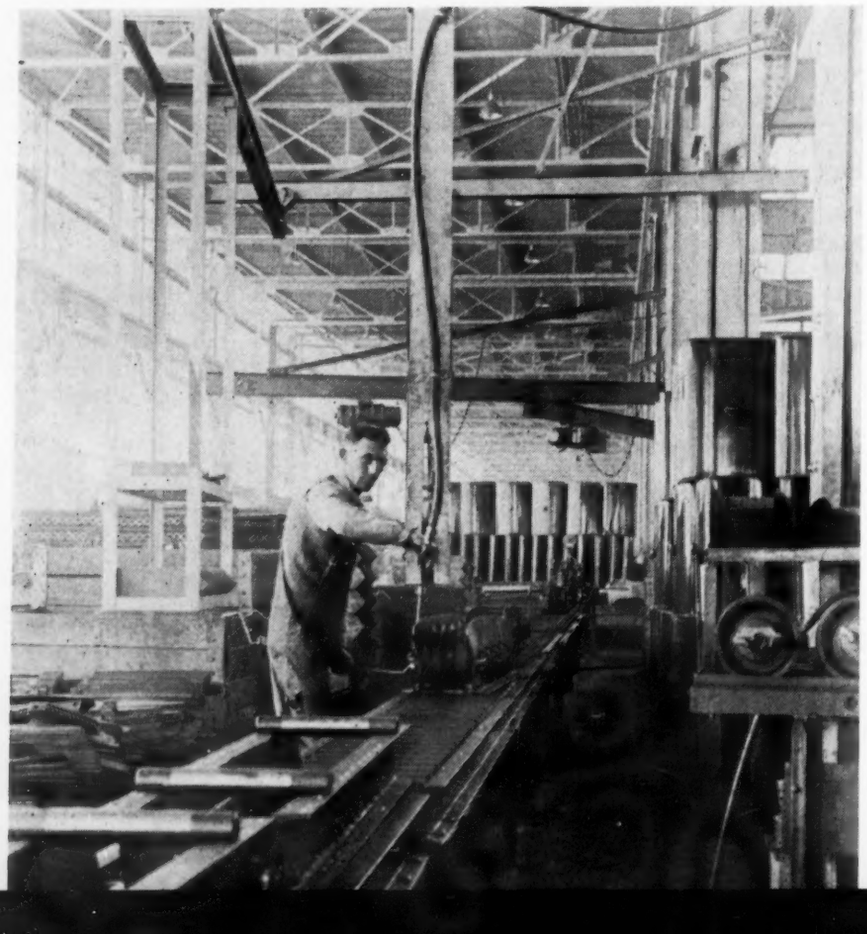
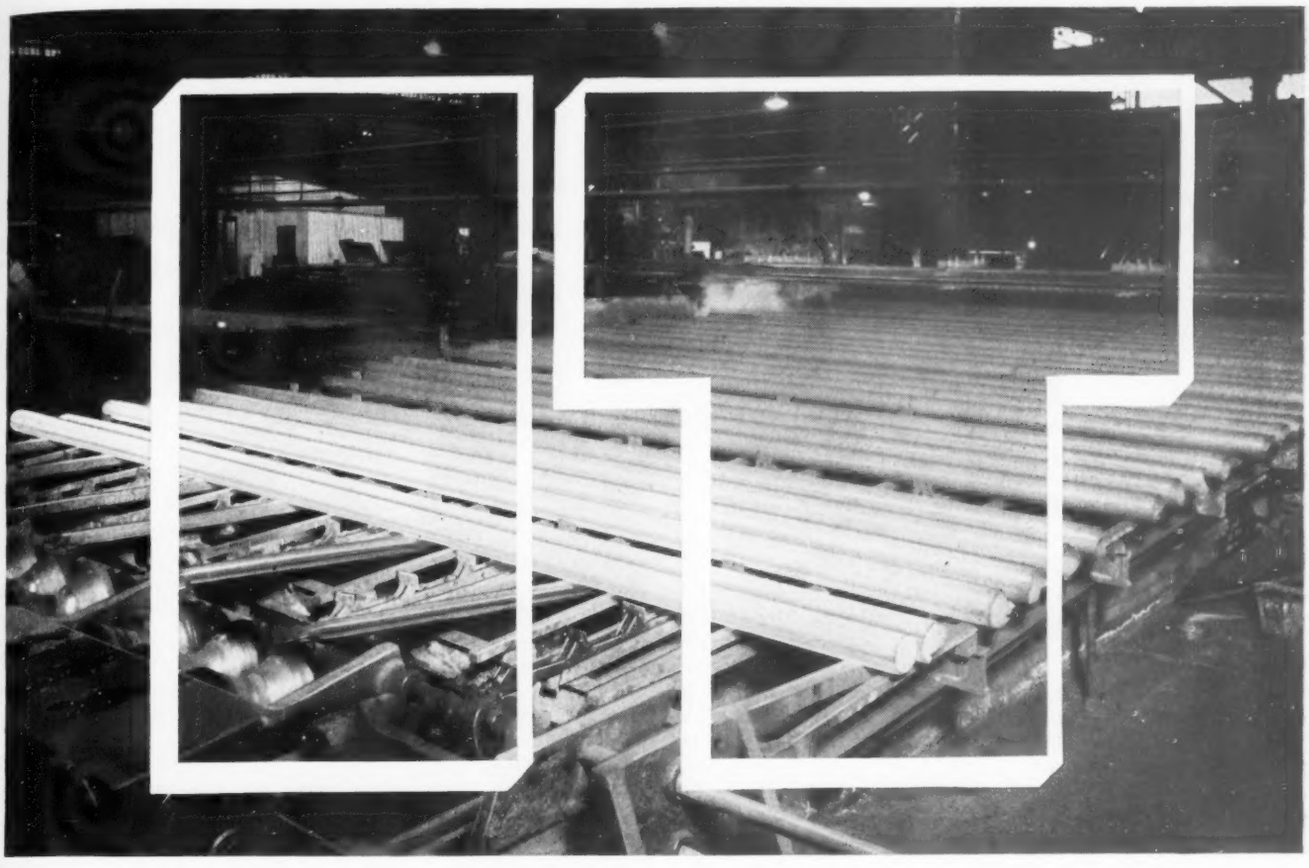
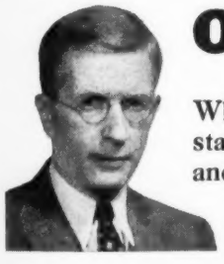


Fig. 3—Where numerous bolts, nuts and small parts are used, trays and impact tightening wrenches are supported on movable tramrails

HOW TO HANDLE



Seven matched strands, making 847 ft. of Rex Unicast Roller Chain, conveying hot tubes in a prominent Eastern mill.



ON YOUR TUBE COOLING RACK

Where white-hot tubes leave the mill in an all but molten state—there's where you will find the tube cooling rack, and a job which has tested many ordinary chains beyond endurance. There, where typical operating conditions include the effects of high heats, great abrasion and shock loads, you'll most likely see matched strands of Rex cooling rack chains moving the pipes down to the cutters.

For in practically every tube and pipe mill in the country, Rex chains are first choice for this severe service. As used on the rack shown above, Rex Unicast Roller Chain with the R-48 attachment is by far the most popular—*often outlasting other types of chains used in this service from two to three years.*

The longer service which Rex Unicast Chain and other Rex steel mill chains have brought to so many other mills is an indication of what they can do for you in your plant. Why not investigate? You'll find all the information you want in the B-444 Catalog. Send for your copy now, while the limited supply lasts. Use the coupon.

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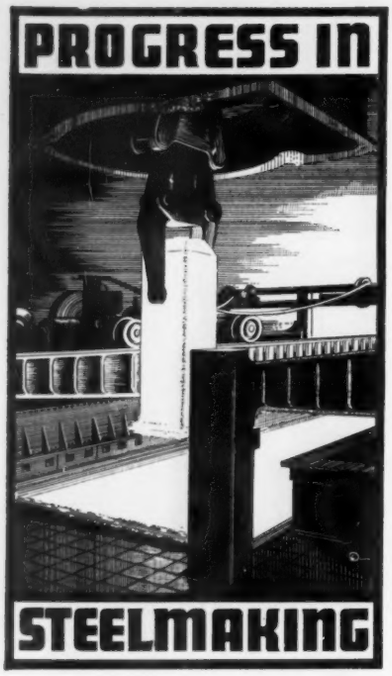


Doubles Capacity

Continuous hot strip mill is widened from 72 to 77 inches and speeded up to 1600 feet per minute. Cold mill speed increased from 300 to 600 feet per minute. Now accommodates coils double the previous weight and length

■ OTIS STEEL CO.'s large continuous hot strip and cold rolling mills at Cleveland have been widened, speeded up and improved to handle coils of double the previous maximum weight and length in an expansion program just completed. It makes this mill one of the country's most efficient producers of flat rolled steel. The entire modernization program, launched when the industry was at peak operations last year, has been completed with a minimum of expense, due to provisions made at the time the mill was built in 1931, when it was the largest continuous mill in the country.

Width of the hot and cold mills has been increased from 72 inches to 77 inches and delivery speeds increased from 1200 to 1600 feet per minute in the hot mill, and from 300 to 600 feet per minute in the cold mill. The widening and other changes were accomplished without withdrawing the mills from production for more than a day at any one time, except during one week when a complete change of gear reduction equipment was necessary to speed up the hot mill finishing train.

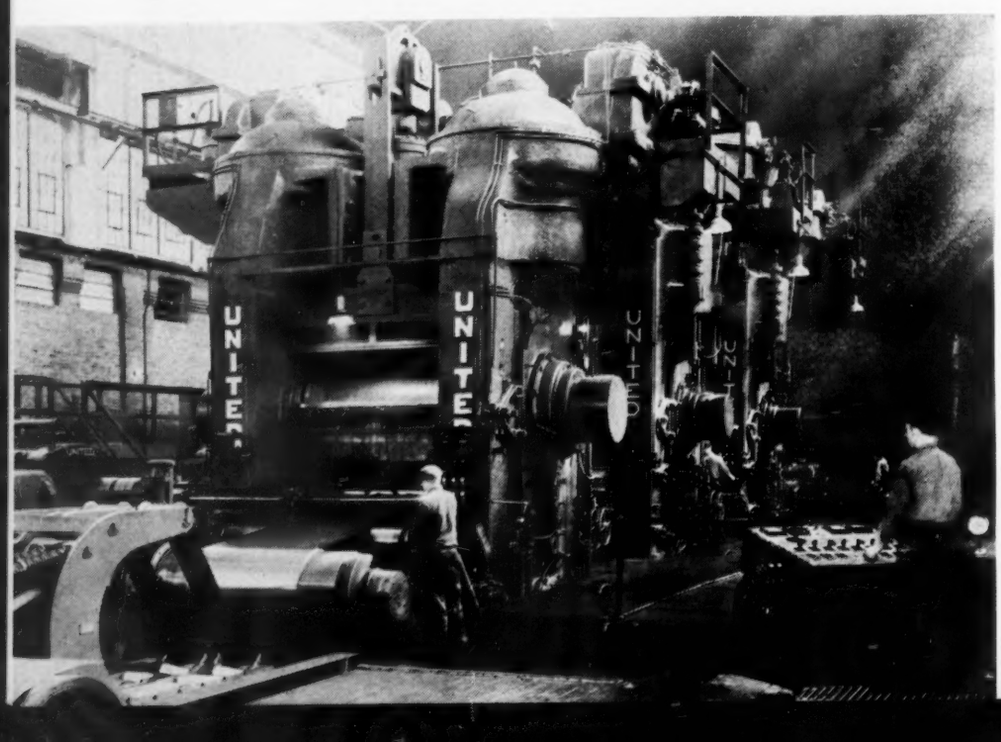
The hot-mill line was rearranged and augmented by transfer of a four-high roughing mill from the roughing group into position as the fifth mill in the finishing line, which was increased from four to six stands. A new 4-high finishing mill, which becomes No. 6, and a finishing scale breaker with the latest type hydraulic spray box were purchased to bring the hot-mill rolling equipment in line with new mills.

The flexibility provided by slotted shoe plates to which the existing mill housings were anchored facilitated widening of the entire rolling mill line. Tables and guides throughout this mill were widened and supplemented to accommodate maximum width strip rolled in the enlarged mill, aprons on the runout table being machined to accomplish this purpose. A new reel of latest design and equipped with unloader has been installed in the hot mill, replacing one of two reels of an earlier type.

Other Facilities

In addition to increase the rolling, coiling and handling speed of the mill, improved facilities for roll grinding and storage have been provided in a new roll shop 50 x 120 feet, constructed alongside the hot mill building. A new 50-ton crane has been installed in this roll shop where two roll grinders have been installed. The mill has been equipped with new rolls required by the increased rolling width and produced in the Otis foundries which supply rolls to many of the leading producers. A transfer car has been installed between mill and roll shop. The mechanical equipment, including roll hook, platforms, walkways, etc., has been altered to accommodate the mill changes.

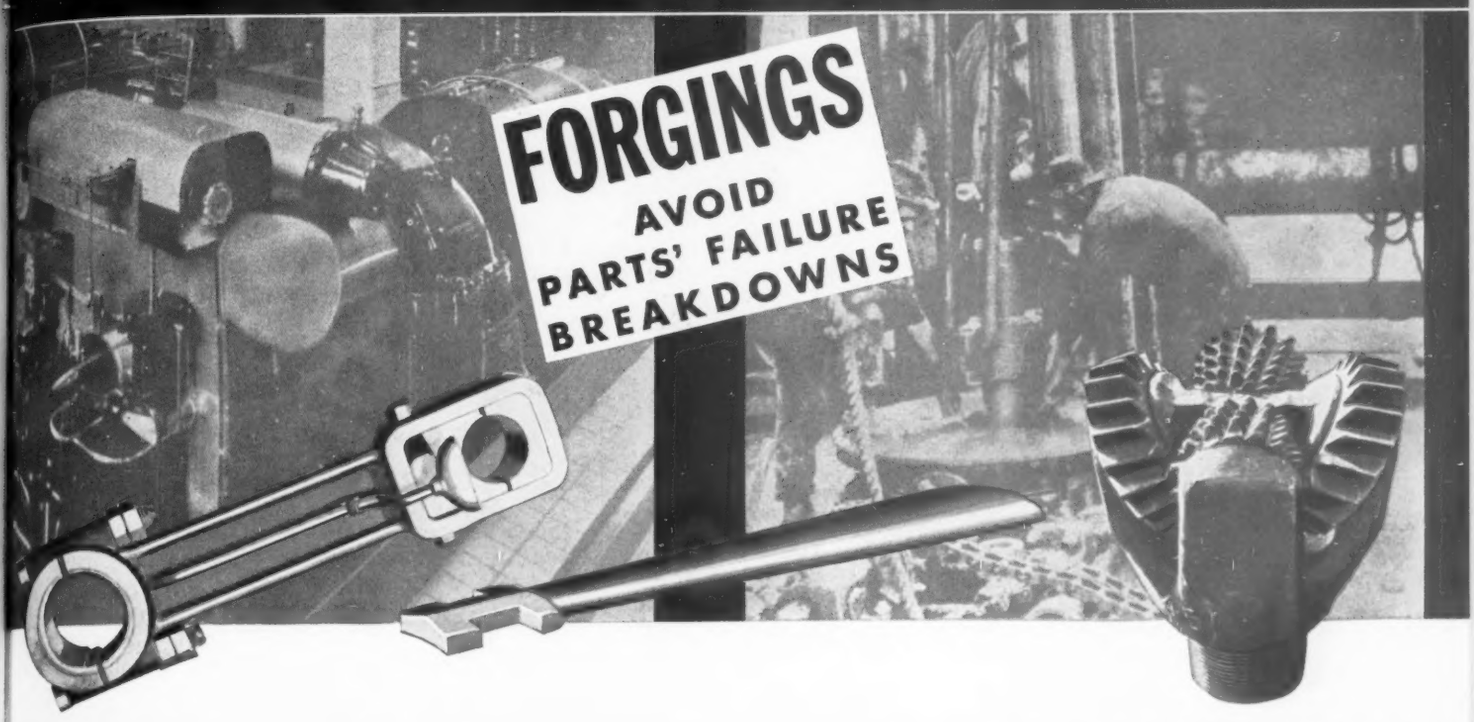
Modernization of the hot strip facilities required far-reaching changes in the layout of busses, switchboards, conduits and controls. Two new 3500-horsepower, 175 to 350 revolutions per minute direct-current motors with a 6000-kilowatt motor-generator set, were added to drive the fifth and sixth finishing stands. A new 400-horsepower, 300 to 1050 revolutions per minute, direct current motor drives finishing scale breaker. These motors



Addition of third stand, foreground, in Otis Steel Co.'s continuous cold mill doubles rolling capacity and speed. Belt wrapper, extreme left, applies tension to start finished cold strip on take-up reel

IN EVERY TYPE OF EQUIPMENT

FROM TURBINES TO ROCK BITS



USE MORE FORGINGS

They cost less to machine and lessen deadweight . . .

• Providing a wide margin of emergency strength to resist the destructive violence of impact shock is not the only gain forgings afford. Forgings eliminate power-consuming deadweight . . . enhance parts' durability and appreciably reduce machining costs. In forgings a uniformity of physical properties is obtainable through heat treatment that is so essential in interchangeable parts. Forgings never vary metallurgically.

And forgings assure parts that are entirely free of concealed defects . . . a factor that avoids parts' failure breakdowns, and cuts machine shop and heat treating rejects to almost zero. Why not decide to get the product improvement, and cost-saving benefits, forgings afford. A competent forgings engineer will be glad to advise you how you can use more forgings to good advantage.

"Drop Forging Topics" is issued monthly, and sent free upon request. Send your name and address if you are not now receiving it, and copies will be mailed regularly.

Says Pump Manufacturer: "We found forgings much stronger than anything else we could obtain; they cut down the cost of manufacture considerably."

Says Steam Engine Manufacturer: "Forgings afford better physical properties and reduction of weight without sacrifice of important strength."

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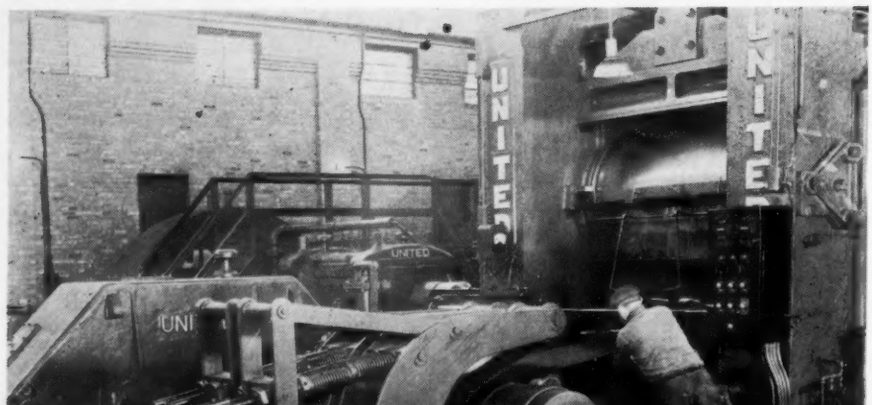


Strip up to 74 inches in width is started on take-up reel by belt wrapper here seen in operation. After coil is started belt wrapper drops back away from reel

and generators increased the short-circuit values to an estimated 350,000 amperes and a possible 500,000-ampere load. Aluminum channel busses and high strength insulators therefore were installed and additional circuit breakers provided as protection to both sides of the hot mill line. Variable-frequency alternator sets for the hot mill runout tables and coilers also had to be changed to accommodate the increased delivery speeds.

The continuous-pickler building was extended 40 feet to accommodate a completely new installation at the entry end, where a new breaker and looping pit have been installed. The entire pickling line has been widened to handle strip of the maximum width produced on the new mills and several additional tanks also have been installed.

Conveyors connecting pickler, annealing and cold mill buildings have been modernized and all annealing is now handled in tubular annealing furnaces with covers of the removable type, each serving a group of three annealing boxes.

Installation of a new third, 4-high stand in the widened cold mill not only doubles the speed of the finishing unit but permits reduction of 0.109-inch strip from the hot mill down to No. 20 gage, 0.037-inch, at a single pass. This tandem mill is the first of such great width to be equipped with a belt wrapper which makes it possible to start finished cold strip on take-up reels by applying tension on the reel. The new finishing stand is equipped with oil film, tapered neck bearings of sealed sleeve type and special tanks, pumps and other equipment have been installed to permit similar lubrication of other two stands in the future.

Adjacent to Cold Mill

A new shear line with side trimming cutters, slitters and leveler has been installed adjacent to the cold mill and leads directly to the skin pass mills which were widened. A new roll grinder has been installed in the connection with the cold mill expansion and is housed in a special roll grinding shop alongside.

A new 1250-horsepower, 250 to 612 revolution per minute, direct-current motor to drive the new 4-high stand in the cold mill and a new 250-horsepower, 300 to 1250 revolution per minute, direct-current motor to drive the take-up reel have been installed in the cold mill motor room which was extended 30 feet to accommodate this new equipment. Electrical conduits to this mill were rerouted and the entire control scheme modernized with a new generator secondary panel, a new reel control panel and tension regulator. Dynamic braking has been provided to insure quick stopping of main drive motors in the face of finishing speeds up to 600 feet per minute.

Products of the widened Otis mills will include widths up to 74 inches and will meet the requirements of industries which use 95 per cent of all flat rolled steel products.

Cold strip at top is entering continuous slitting and shear unit. Lower view, taken on drive side of hot mill, shows the six 77-inch finishing stands, two of which have been added in improvements recently completed

Peripheral Distribution of Gases Affects Blast Furnace Efficiency

■ TO the blast furnace operator the fact that a given furnace elsewhere may be perhaps 10 per cent more efficient than his is a matter of interest. But what is of more interest to him is that his own furnace will vary 10 per cent in efficiency for no apparent reason. Without any change of which he is sure, production will drop 10 per cent, and after he has tried vainly for a time to regain this loss, it suddenly will be regained just as mysteriously as it disappeared.

Or perhaps the operator has two furnaces side by side being charged with the same material, but one furnace will operate satisfactorily and the second poorly. The materials are the same, the individuals similar, yet the large difference exists. Obviously more data is needed; the question is what data and how to obtain it.

Sheds Light

To shed additional light on this subject was the purpose of a 62-page, highly detailed paper, "Peripheral Distribution of Gases in the Blast Furnaces," presented at the general meeting of the American Iron and Steel institute in New York, May 26, by H. W. Johnson, superintendent of blast furnaces, Inland Steel Co., Indiana Harbor, Ind.

The speaker said many notable contributions in the field of iron production have led to better understanding of the process. These contributions are the result of both experience and investigation, and have done much toward eliminating uncertainty of operation. Uncertainty still exists, however, and probably will remain in some degree as long as the blast furnace is used to produce iron.

The author contributed additional information collected in the hope of improving control and efficiency of a group of blast furnaces, applying methods devised by the bureau of mines. This information was accumulated by operators, not scientists, and consequently probably embraces shortcomings from an academic standpoint.

Original work of the bureau of mines, Mr. Johnson continued, consisted of investigations in the tuyere zones of 14 American blast furnaces. This was followed by studies on the experimental blast furnace at the University of Minnesota and commercial furnaces at Holt, Ala., at South Works, Illinois Steel Co., and at Columbia Steel Corp., Provo, Utah. Briefly, the studies proved that efficiency of a blast furnace is determined by the flow of gas within the furnace, particularly in the shaft or upper section. That is to say, if the flow of gas is correct and there is proper contact between gas and ore, there will be good results; but if there is poor contact, results will be poor.

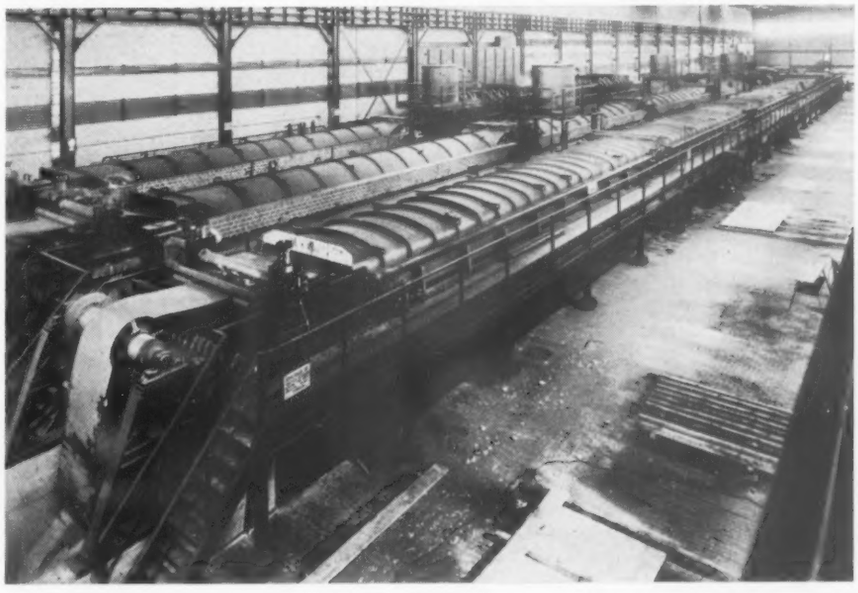
Once it had been determined that differences in efficiencies was the result of differences in gas flow in the furnace, the next problem was to determine what controlled gas flow. This led to several studies, the author stated. At this point, Mr. Johnson reviewed the work of the bureau of mines and gave reasons to substantiate the belief that continuing their investigations and applying their methods to a study of peripheral distribution of gas would yield data of value. After describing the method developed for measuring gas flow, he detailed variations which were found.

The speaker explained the influence of these variations by graphical presentation. Numerical values were developed for measuring the degree of uniformity of peripheral gas flow and it was shown that furnace production and efficiency correlated with these numerical values. Mr. Johnson then presented a detailed study of furnace operation for a 20-day period showing how inwall temperatures can serve as a guide to furnace operation.

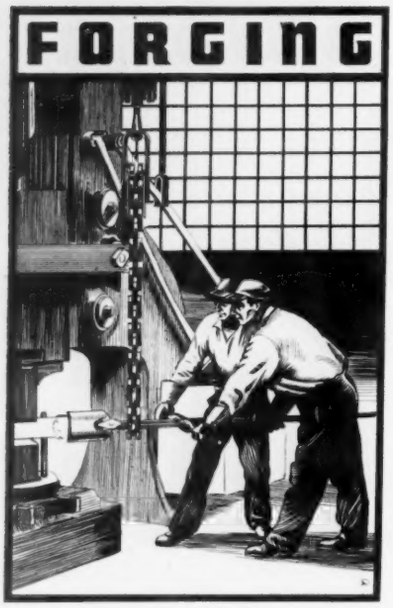
Data collected has been helpful in two ways, he contended. It has furnished an explanation of some of the unusual behavior of the furnaces. It has also served as a crude measure of the radial distribution of the gas and showed in what direction changes in that distribution should be made. There is every indication that the correct radial distribution is more likely to result in correct peripheral distribution. No attempt was made to discuss other causes of poor peripheral distribution. It is undoubtedly a function of the effective voids in every plane in the blast furnace. Much more data is needed before a conclusion can be established.

Equipping a furnace to measure inwall temperatures provides a useful guide, not a panacea, Mr. Johnson warned. The beautiful correlations one expects in laboratory experiments will not be evident.

Continuous Strip Pickler Has Rubber Lining



■ Recently placed in operation by Great Lakes Steel Corp., Detroit, is this continuous strip pickler, the third installed by that company and designed in conjunction with engineers of B. F. Goodrich Co., Akron, O. Major acid handling equipment consists of four separate 60-foot acid tanks and two 26-foot water tanks. Tanks are of heavily reinforced, welded steel, lined with Triflex rubber and sheathed inside with 8 inches of acidproof brick joined by special sulphur-base compound. The unit is one of widest in country having inside finished width of 104 inches, sufficient for strip 92 inches wide. The pickling room is free from acid fumes, sectional hoods being connected to a ventilating and sewer system of compact design. All auxiliary equipment is rubber lined



Batch Forging Furnaces

New furnaces use combustion control and more insulation to reduce scale and decarburization, to stop overheating steel, increase refractory life, cut fuel costs

■ ONE OF THE NEWEST developments in the alloy tool-steel industry has been the widespread adoption of natural-gas-fired furnaces to heat ingots and blooms for forging and rolling. These furnaces with controlled atmospheres replace older designs of coal-fired equipment.

During the past few years, Pennsylvania Industrial Engineers Inc., Pittsburgh, has designed and built batch-type furnaces for manufacturers of alloy steels. These manufacturers are concerned primarily with the economical production of high-grade alloy steels. These furnaces produce nearly every grade of steel except straight low-carbon steels. As many as 250 different analyses are manufactured in the same plant.

With such a wide variation in the kinds of steel made, it is apparent that the same furnace practice is not adaptable to all alike. It has been found of prime importance to supply equipment which can be calibrated in the field to produce the different furnace-atmosphere conditions desired. When calibration is completed, equipment must be capable of reliably reproducing conditions. Furthermore, the equipment must be flexible enough to permit operation over a wide temperature range and to allow operation on heating cycles best suited to the steel in question.

Heating Cycles Vary

To illustrate, some grades of steel require a slow heat or soak at a temperature below 1200 degrees Fahr. for a period of time, then rapid heating to a forging temperature of 2100 degrees Fahr. During this cycle, a constant furnace atmosphere must be maintained which will produce the best surface on the steel and prevent scale formation and decarburization. It has been found that these results can be satisfactorily accomplished by the proper combination of furnace design and burner equipment. Fig. 1 illustrates a typical battery of these forging furnaces.

Best results are secured by the use of low-velocity type burners which are characterized by the highly luminous flame developed, the length of flame being readily adjusted to suit the individual furnace requirements. A soft, penetrating fire is produced, resulting in lower furnace temperatures and consequently longer refractory life. At the same time, very little scale is formed.

Burners are equipped with air-gas ratio control so ratio of air to gas entering the furnace is maintained constant at all rates of firing. A single valve in the air line controls rate of firing. Fig. 2 illustrates a typical burner application.

Led to Burner

Gas from distribution header is led through a diaphragm-operated valve to the burner. Between valve and burner, a special union is placed, containing thin plate orifice the size of which is carefully selected to give the proper gas flow at the available pressure. Air is supplied from a manifold through a pipe to the burner. A blast gate is inserted in the line to regulate the flow of air as desired. Air pressure in the line between the blast gate and an orifice union in the air line is measured on a manometer and transmitted to the top of the diaphragm valve in the gas line. Any increase in air pressure or flow will be transmitted to the diaphragm and cause the valve to open wider, thereby permit-

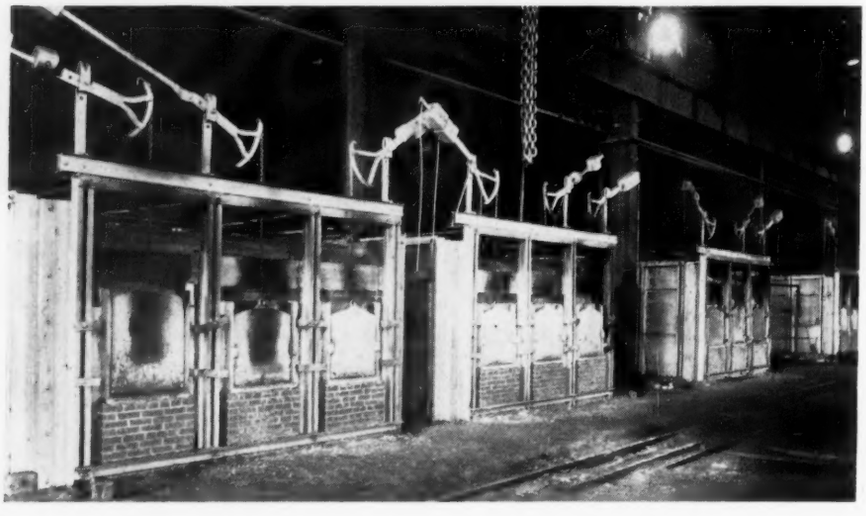
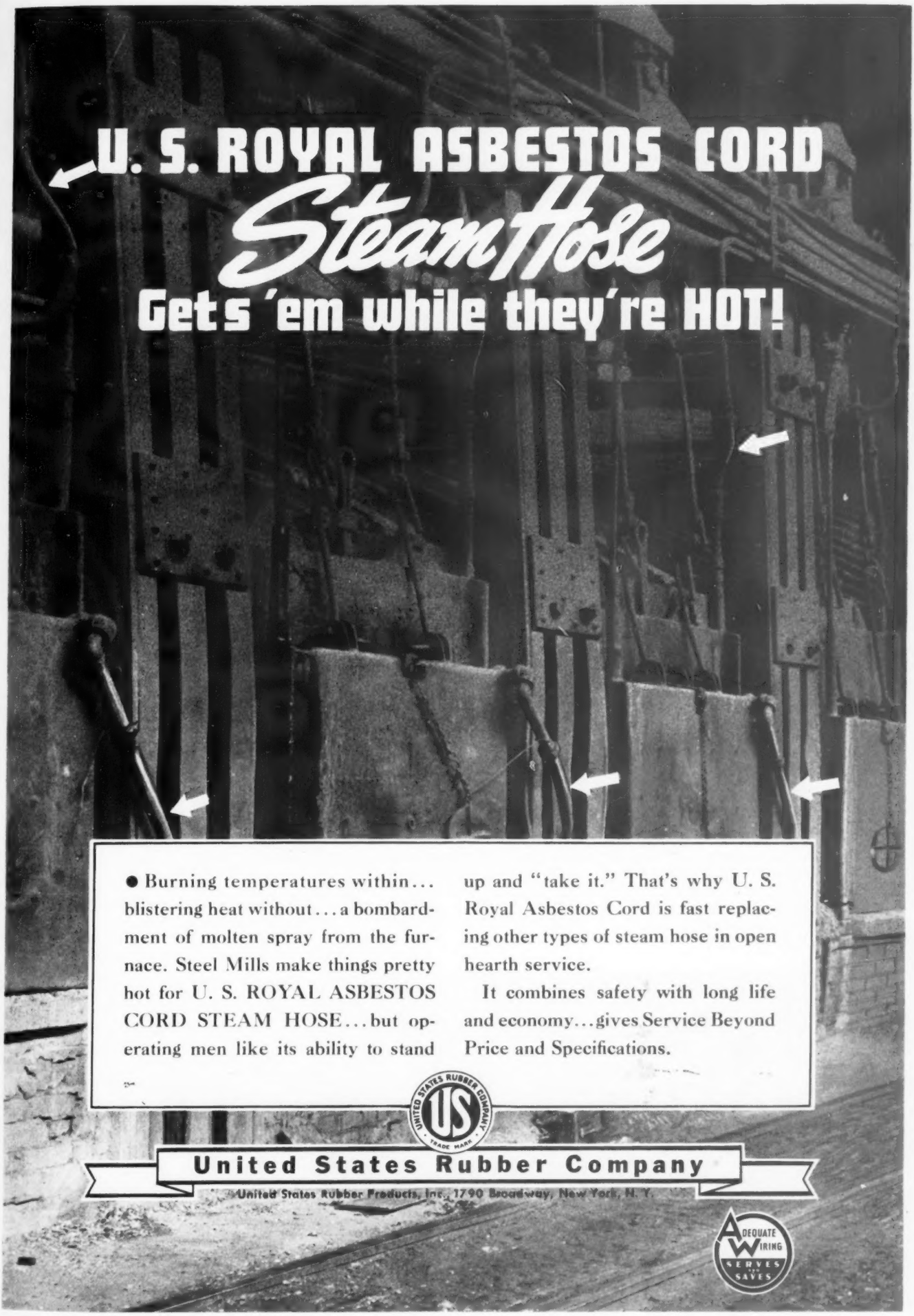


Fig. 1—Bank of batch type furnaces for forging and rolling, heated by gas with combustion control


U. S. ROYAL ASBESTOS CORD
Steam Hose
Gets 'em while they're HOT!
● Burning temperatures within... blistering heat without... a bombardment of molten spray from the furnace. Steel Mills make things pretty hot for U. S. ROYAL ASBESTOS CORD STEAM HOSE... but operating men like its ability to stand up and "take it." That's why U. S. Royal Asbestos Cord is fast replacing other types of steam hose in open hearth service.
It combines safety with long life and economy... gives Service Beyond Price and Specifications.
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ADEQUATE WIRING SERVES AND SAVES

ting a corresponding increase in gas flow.

This system of air-gas ratio control has been satisfactory and maintains a constant ratio of fuel-air input to the furnace. Where it is desirable to vary the atmosphere and the air-gas ratio to suit different grades of steel, a variable orifice is installed in the gas line. This variable orifice is calibrated in the field by the use of a gas analyzing machine. A given setting of the variable orifice gives the same furnace atmosphere at any time. By setting the orifice at a number of points and determining the furnace atmosphere at these points, calibration is accomplished. Table 1 represents a typical field calibration on a furnace in which the burners are equipped with a variable gas orifice.

TABLE I—Furnace Atmospheric Analysis

Orifice setting	Gas flow cubic feet per hour	Per cent carbon dioxide	Per cent oxygen	Per cent carbon monoxide
1	2640	11.6	0.0	0.6
	3300	11,6	0.0	0.6
	4500	11.6	0.0	0.6
2	1860	11.4	0.6	0.0
	3360	11.4	0.6	0.0
	4200	11.4	0.4	0.0

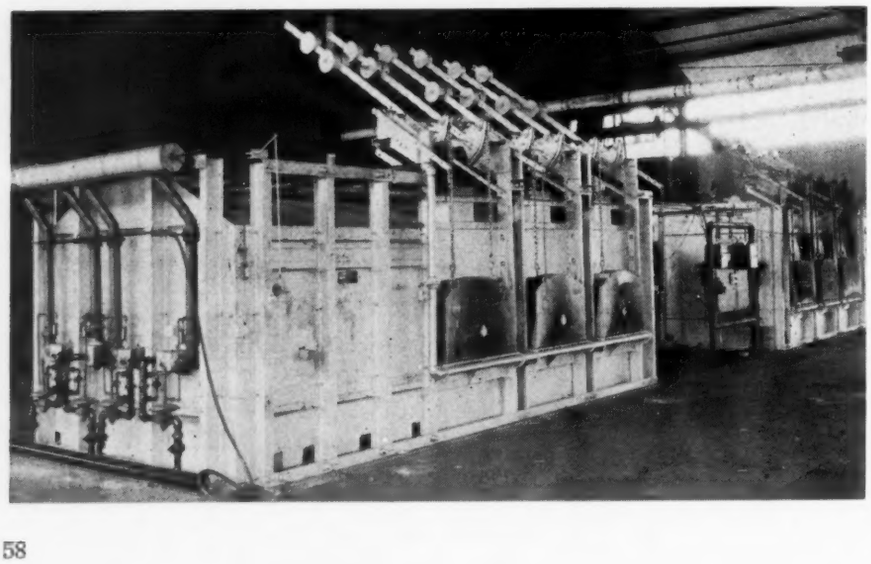
Much wider ranges of furnace atmosphere than shown can be obtained by appropriate adjustments of the variable orifices. The table also illustrates the constancy with which atmospheres are maintained for any given setting over wide variations in fuel input. These results, however, are only possible when the furnace is maintained at a pressure equal to or slightly above surrounding atmospheric pressure. As an aid in securing this pressure, adjustable dampers are incorporated as part of the furnace equipment. These dampers are regulated by the operators to maintain the desired conditions or may be attached together and operated from the same lever which operates the air control valve. This latter method automatically controls the furnace pressure in relationship to rate of firing and is a material aid in maintaining the proper atmosphere.

Controllability of the furnace atmosphere results in a reduction of the amount of scale formed during the heating operation and in a control over the type of scale produced. Also the amount of surface decarburization is materially reduced because the proper atmosphere for the steel in question can be selected.

Either Control Applied

Accurate temperature control, either hand or automatic, can easily be applied to this type of furnace. By operating a single valve installed in the main air supply line, a uniform temperature can be maintained over the entire hearth. This is possible by using a sufficient number of burners and distributing them properly to supply heat over the hearth uniformly. Such control eliminates losses due to improper heating. In addition, formation of smoke and soot is prevented. This elimination of dirt is a desirable factor since it creates much better working conditions. There is the further advantage that operating cost of these furnaces is usually lower than with older equipment. This is a result of using proper insulation and accurate control of combustion conditions, thus preventing waste of fuel.

Fig. 2—Combustion control equipment is in sight at end of furnaces in extreme left part of illustration. Coupling sections containing orifices are shown bypassed by small cutout line



Text on Galvanizing Covers Entire Field

■ *Hot-Dip Galvanizing Practice,* by W. H. Spowers Jr.; cloth, 203 pages, 6 x 9 inches; 45 illustrations; published by the Penton Publishing Co.; supplied by STEEL, Cleveland, for $4; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

This treatise comes from the pen of an American consultant in galvanizing technique. His years of experience and labor in the field of galvanizing have qualified him for his undertaking.

Problems of galvanizing are expressed in simple style and the book is highly recommended to officials of galvanizing concerns, attendants of zinc kettles and their helpers, engineers, metallurgists, galvanizing machinery manufacturers, furnace designers, pyrometer makers and others engaged in coating various steel products with zinc.

Mr. Spowers in 23 chapters gives the principles followed in zinc coating, fluxing, dross recovery and kettle design. He then describes how to galvanize wire, poultry netting and hardware cloth, pipe, sheets, pipe fittings, stamped metal ware, range boilers and barrels, and concludes with a discussion of pyrometry in hot galvanizing.

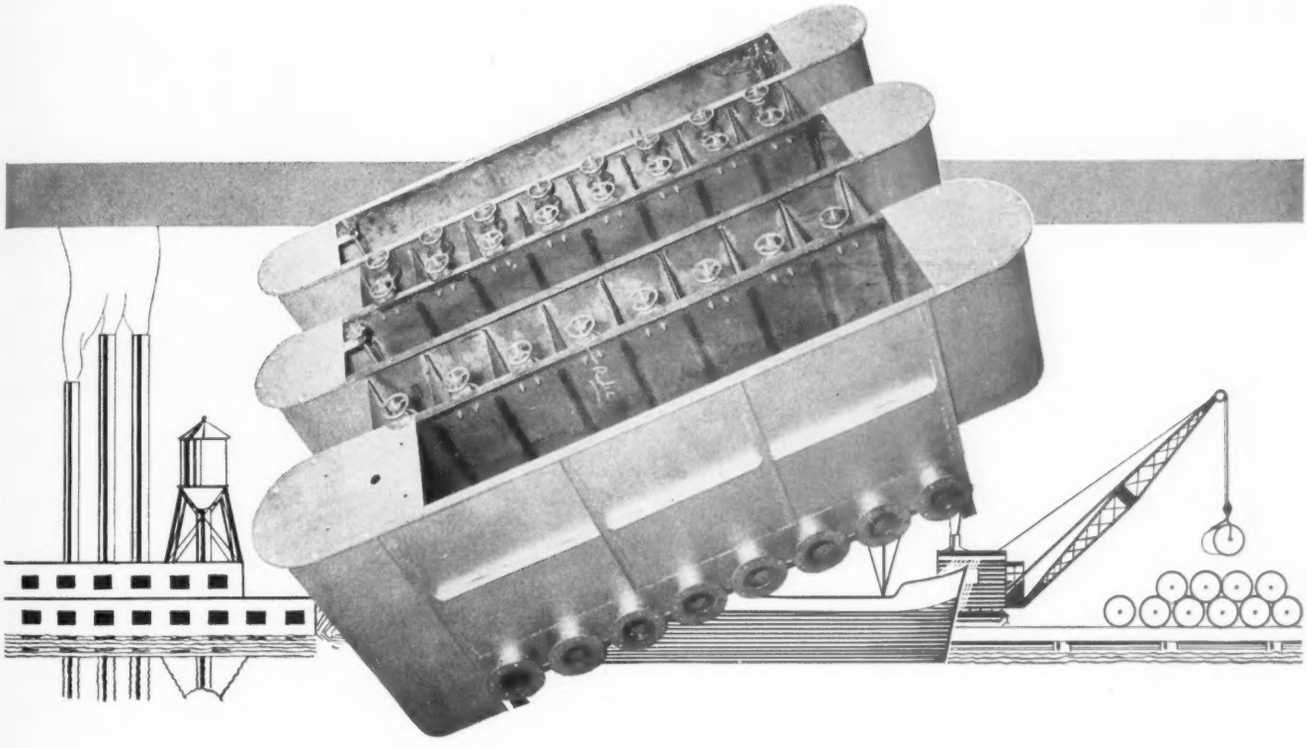
The author presents eight 6 x 22-inch drawings of furnace settings, layouts, asbestos wipes, etc., inserted in a pocket on the inside of the back cover for the convenience of the reader.

Appended is a 61-page bibliography of references to zinc coating of a general and miscellaneous character, history and development, galvanizing procedure, equipment and fuels, effect of galvanizing, tests of coatings, specifications, galvanizing plants, by-products and their recovery, and United States and British patents dealing with galvanizing.

The steel industry long has waited for a treatise on galvanizing practice for it has been almost a decade since one has been available. Hence this volume should meet with a wide response for it satisfies the need of those who have anything to do with the art of coating steel with zinc.

Tough Going

FOR ORDINARY METALS?



USE ARMCO STAINLESS STEELS

Paper mill men used to build these big head boxes of wood. Not because they wanted to, but because they couldn't find anything else, within reasonable cost, that would do the job.

Now what? Armco Stainless Steel of a specific grade—a grade that strengthens the equipment, boosts service life and, most important, enables production of finer, cleaner, more profitable paper.

We're forgetting about the "pretty" uses of Armco Stainless in this advertisement. Industrial applications are on our mind—the real tough jobs. High strength, corrosion resistance, heat resistance, for instance . . . the jobs for which ordinary metals, as useful as they may be, simply are not qualified.

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ARMCO

ARMCO STAINLESS STEELS

Welding By Friction

Special equipment attains high production by unique fabrication methods. Heat, generated by friction, results in controlled plastic flow giving desired shape to item

■ MAKING NOTHING but fabricated pipe, Production Plating Co., Lebanon, O., has developed some interesting fabricating methods. Starting in business in 1924 and specializing in manufacture of gas stove manifolds, operations at first consisted of polishing and plating full lengths of pipe which were subsequently cut to length and threaded. From these plating operations, the company derived its name.

At that time, both ends of gas manifolds were threaded and one end closed by a screw cap, gas being supplied through the other end and distributed to burners through outlets in the manifold. However, the trade wanted a blunt end so flat pieces, same diameter as pipe, were butt welded to close the end. Although an improvement, this method was sufficiently costly to warrant further development which finally resulted in the present method where the pipe end is closed by flowing the metal together when in a plastic state.

Figs. 1 and 2 show views of this operation. Prior to ending, as this operation is called, pipe is unloaded from cars by cranes and stored until wanted for production. Pipe is cut to length either by rotating it against a cutting tool, or by use of a band or circular saw. Sections then are loaded into boxes, handled by lift trucks, and taken to ending machine.

Special Machines

This is a special machine made expressly for this work. It rotates pipe at high speed against a friction wheel which is turning slowly in line with length of pipe. Resulting friction develops heat in the pipe end which becomes plastic and flows as directed by the friction wheel, closing up pipe end. Several unusual features are encountered in this machine and its operation. Operator steps on a foot pedal opening a collet and inserts a pipe, previously cut accurately to length, in spindle of machine. Clamps and collet are actuated by air cylinders in such a manner as to open only when foot pedal is pressed. Operator pushes pipe against a spring in back end of spindle and releases pedal, permitting clamps and collet to operate.

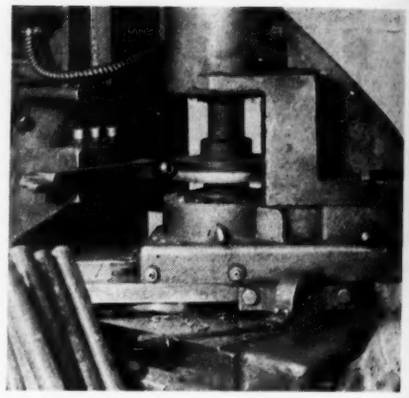

Fig. 1—Pipe in ending machine. Partially closed end is seen at level of rotating disk

Pushing start button, mounted on an arm within easy reach, starts special 10-horsepower compound-wound direct-current motor which goes from standstill to full speed in 1½ seconds. Thus 1½ seconds after start button is pushed, spindle holding pipe is rotating at 4000 revolutions per minute and operator is swinging friction disk against end of pipe.

Friction disk, 1 inch thick and 6 inches diameter, is driven 65 revolutions per minute by motor mounted overhead on column and connected by two universal joints so disk can be swung about end of pipe. Lever arm ratio permits operator to exert tremendous pressure against end of pipe without exces-

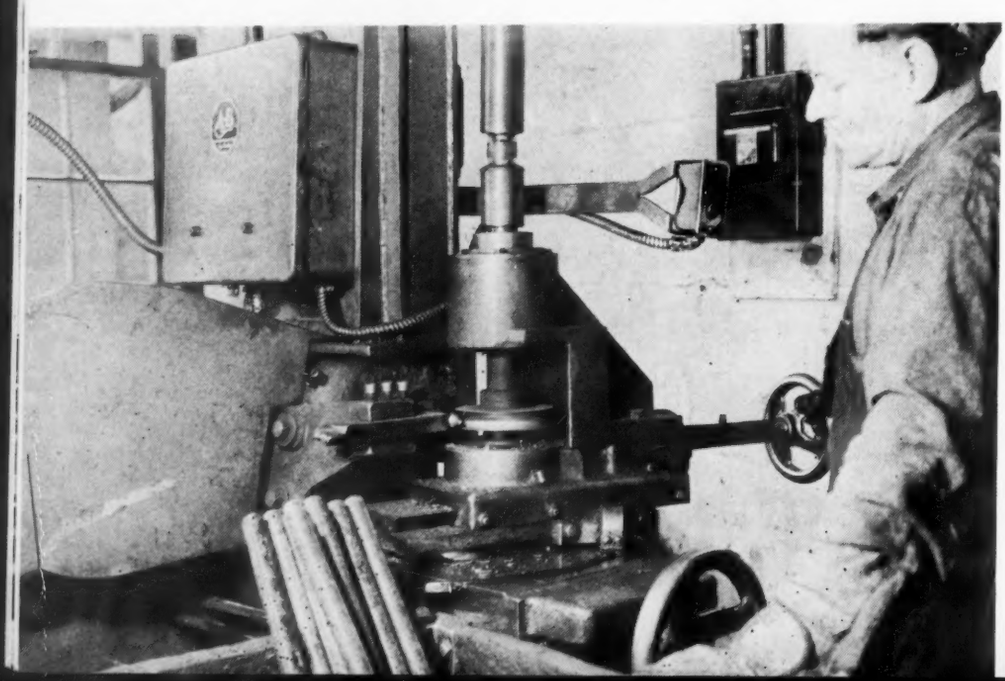

Fig. 2—Here pipe end has been completed and operator has swung rotating disk to right angle position. Pipe spins at 4000 revolutions per minute against this disk during ending operation

BEFORE— *Hot and dirty*

AFTER— *Cool and clean*

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Now, welding and machine shops can join the procession of restaurants, theatres, trains, offices and stores that is swinging to air conditioning for increased profits. Lincoln, pioneer of cost cutting developments for welding, now introduces the "LINCONDITIONER."

By filtering the smoke and removing the heat of welding operations, the "LINCONDITIONER" contributes materially to the comfort of the man-at-the-arc and to the improvement of shop conditions generally. This improvement in working conditions enables the welder to turn out more work per hour with less fatigue, resulting in higher quality production and lower costs.

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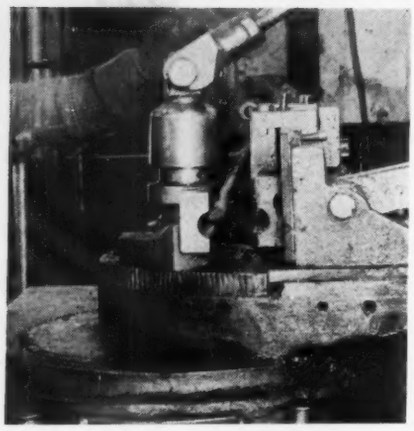


Fig. 3—Special bending equipment. Moving mandrel over which pipe is drawn can be seen

sive effort. Disk rotates in a direction to flow the plastic metal from the side of pipe towards the end. Entire disk mechanism pivots in a horizontal plane on a point directly underneath center of pipe.

Fig. 1 shows pipe end partially closed and friction-wheel mounting at about 45 degrees with the length of pipe. Fig. 2 shows end completely closed and the mounting swung at an angle of about 90 degrees with the pipe.

Operator swings disk mechanism with right hand, adjusting radius of swing at same time. With first pressure of wheel, pipe end flashes white hot. With each successive swing, operator moves disk up closer and shifts pivot point with hand wheel, controlled by left hand, to rapidly close pipe end. Edge of disk is curved on same radius as outside circumference of pipe being worked, causing plastic metal to assume semispherical shape at pipe end. Only a few passes of disk are needed to close pipe completely.

Pushing stop button stops spindle in 1½ seconds by reversing current through motor so pipe comes to rest almost instantly. Stepping on pedal releases clamps and spring at rear of spindle pushes pipe out where operator can grip and remove it. Another length of pipe is inserted in spindle and operation repeated. Entire ending operation is extremely fast requiring only a few seconds per piece. Average output with standard ¾-inch steel pipe is 200 pieces per hour. As high as 350 per hour have been produced on certain sizes of small pipe.

When this method was being developed, pipe end was heated and formed by rotating against a square block which was swung in a circular

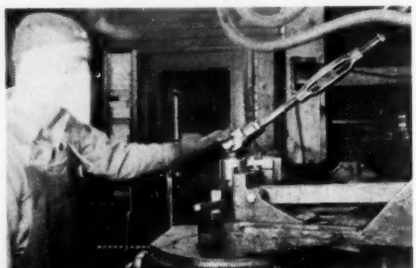


Fig. 4—Here air clamps have been operated and bend is started

motion to close end of pipe. However, it was necessary to change position of this block every 30 or 40 ends made due to extreme wear, total production being only 400 to 500 pieces per block. Also ends formed were not perfectly smooth as was desired. Use of slowly rotating disk in place of block easily ends 60,000 to 100,000 pieces and as contact point is continually changing wear is evenly distributed and ends made are smooth to eye and touch.

Pipe ends now produced are semispherical in shape and hermetically sealed as the hot working produces a perfect weld. Each is tested with 90 pounds air pressure in water. Ending eliminates both threading and special cap, makes a neater job, takes up less space in range interior and costs less to produce.

Ends of pipe are closed in this manner not only to make range manifolds but also for hollow handles for such equipment as pipe threaders, etc. The process appears to be equally suitable for all types of metals including copper, steel and steel alloys, but not brass. End of brass pipe crumbles when heated by friction, apparently due to zinc melting out first.

Sharp Bends Made

After ending, pipe is trucked to bending and forming machines. Before 1931, most gas range manifolds were straight and on outside of the range. In that one year, however, development of "streamlined" models, with all parts enclosed and smooth rounded exteriors, made it necessary to use bent manifolds to efficiently utilize interior space. Before this, the American Gas association did not permit use of bent manifolds, but the new type of range construction brought about approval of their use under certain specifications; that is, the cross section area at the bend must be equal to that of standard heavy pipe.

Several special machines are employed in making pipe bends, using moving mandrels the pipe being pulled over the mandrels to prevent flattening. Hydraulic machines with shoes and blocks form other bends. Heavy presses also are used in making bends. Standard pipe, ¾-inch inside diameter and 1-1/16-inch outside diameter, the size which constitutes about 80 per cent of pipe fabricated here, is formed to a 90-degree bend on the extremely short radius of 1¾ inches. Development work now under way is expected to make possible bending this size pipe on a 1-inch radius.

Fig. 3 is a closeup of machine used to make short radius bends with a moving mandrel. The machine operator slips a length of pipe over mandrel, operates a pedal which clamps the pipe by means of air cylinders actuating toggle mechanisms, and throws bending head drive into action which swings head around, pulling pipe over mandrel and producing desired bend. Fig. 4 shows a pipe clamped and partially bent. Bending head rotates horizontally from right to left as viewed here. Overhead rubber tubes carry air to clamping cylinders.

After bending, pipe is trucked to special machines for drilling and tapping outlets to individual gas burners. Originally holes were drilled in standard pipe and tapped. American Gas association, however,

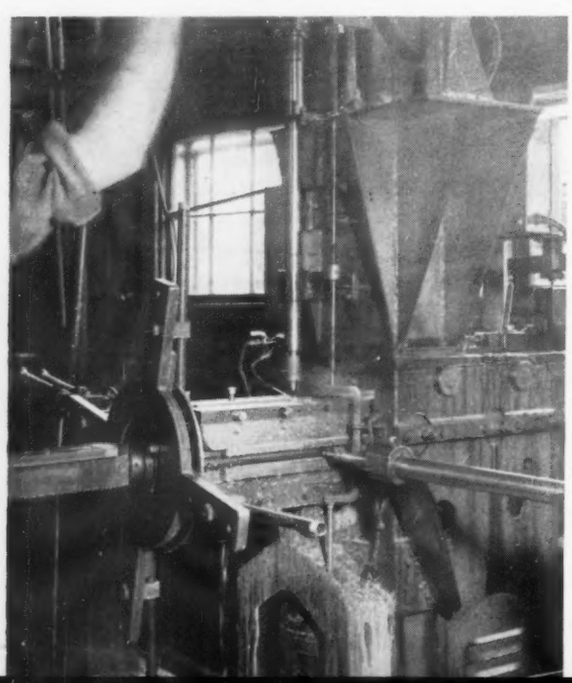


Fig. 5 — Multiple drilling, expanding and tapping machine handles four pipe manifolds at once

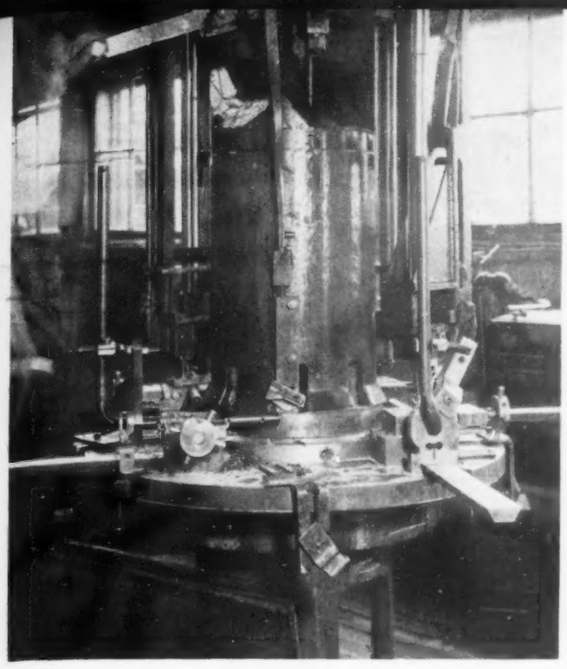


Fig. 6 — Automatic drilling, expanding and tapping machine. Operator simply loads and unloads fourth station and indexes machine for continuous operation

ruled that 3½ full running threads were necessary which required extra heavy pipe to give the required wall thickness. To enable use of standard pipe, this company first used a drag punch. However, this was not entirely satisfactory as frequent cracks in sidewall of hole occurred which prevented the required 3½ continuous threads. Subsequent work developed the unique method now used.

Holes Expanded

First a hole is drilled considerably smaller than finished diameter. This hole then is expanded by inserting a round-ended stellite tool which revolves at 10,000 revolutions per minute with about 1000 pounds pressure being applied. This instantly causes the metal to become white hot and in this plastic condition it is upset both inside and outside the pipe along the traverse of the tool giving a wall of the desired length and thickness in which threads are tapped in subsequent operations. Amount of metal removed by drilling determines the amount upset to form walls for threading. Thus number of continuous threads in finished piece is established by size of drill used. The stellite tool will go through the pipe much faster than a drill but in so doing all the metal it displaces is upset inside and outside the pipe producing more threads than are necessary and partially obstructing the passageway in the manifold. So pre-drilling is required. This development makes it possible to use thin walled pipe and yet obtain the desired number of continuous threads.

Lengths of pipe, placing and number of bends, placing and number of outlets all vary widely so there is no uniformity in manifolds. Orders consist of from 100 to 5000 identical pieces and there may be 15 or 20 different orders in the plant at once. As more than 1500 tons of pipe were fabricated last year with manifold production running well over a million pieces, all operations of closing ends, bending, drilling, expanding and tapping must be set up on a high production basis. Making about 95 per cent of all manifolds used by gas-range industry last year and practically all of the handles used on pipe threaders as well as a large quantity of furnace coils and special fabrications, high output is essential for low-cost, efficient production. This has necessitated special machines being developed to handle this work.

Besides the ending and bending machines already described, there are a number of special automatic machines which drill, expand and tap the outlet holes. Fig. 5 shows a machine used with manifolds requiring a number of outlets in a row. Fixture holding four manifolds, one on each side, travels in and out of the machine and can be rotated when withdrawn from the machine. It is supported by external devices at each end. One of the four sides is open.

Procedure is as follows: A new piece is clamped in the open station. As the fixture is withdrawn to clamp in another new piece and remove a finished manifold, it is revolved one quarter turn, bringing the new piece under the drilling head. As the fixture slides in to successive working positions, holes are drilled in the new piece, the piece already drilled has its holes expanded, and the piece already expanded has its holes tapped. Thus operation is continuous and quite fast, several hundred finished holes being produced per hour.

Holes Vary

Holes vary in size to accommodate from ⅛ to ⅜-inch standard pipe threads. Holes for ⅛-inch standard thread are made with a ¼-inch drill, and expanded with a 11/32-inch stellite tool. There are from 3 to 12 holes per manifold.

For producing single holes, such as required for oven or pilot burners, the automatic machine shown in Fig. 6 is used. It has a loading-unloading station and three working stations, for drilling, expanding and tapping. The table holding the work revolves around under the various heads. Operator simply indexes table and heads work automatically while he is unloading the finished piece and clamping in a new one. As heads work extremely fast, production is limited only by speed of operator in unloading and loading fixture. Output is as high as 350 pieces per hour.

Manifolds having outlets at special angles are taken care of in other machines in clamps which hold the piece so outlet is at top side of pipe. Work in these fixtures then is handled by three operators, one working a drill, a second expanding the holes and a third tapping holes,

(*Please turn to Page* 69)

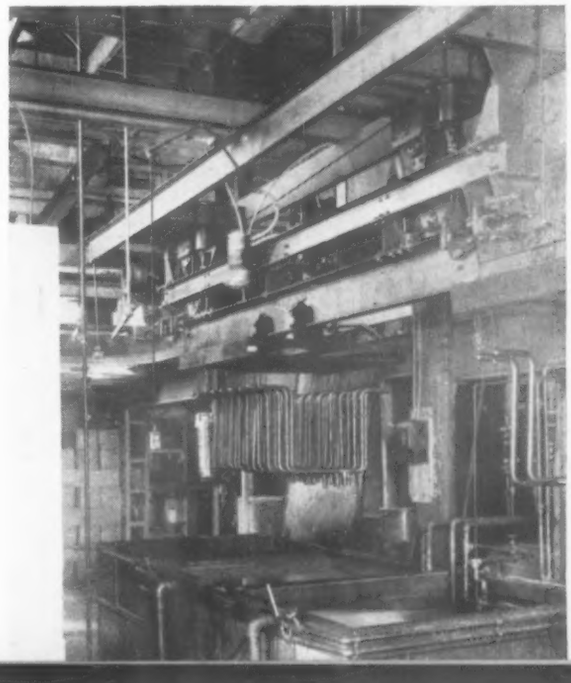
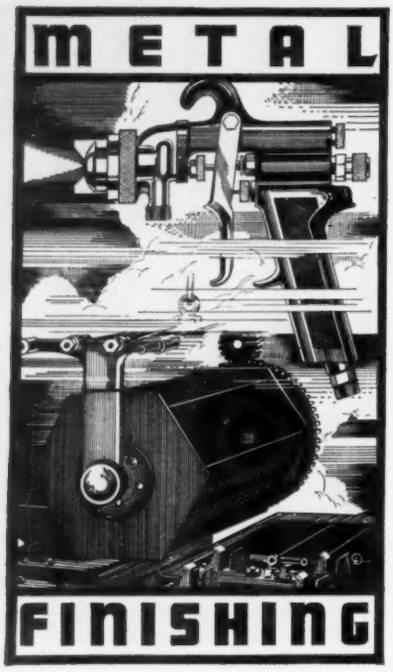


Fig. 7 — View of japanning room where elevator section on monorail facilitates continuous finishing operations. Monorail travels through baking oven at extreme left, also



Stain Spotting

Even costly lacquered articles frequently show iridescence, bloom, flaking, stains, spots and other defects largely caused by using wrong type of lacquer as shown here

By G. KLINKENSTEIN
Technical Director
Maas & Waldstein Co.
Newark, N. J.

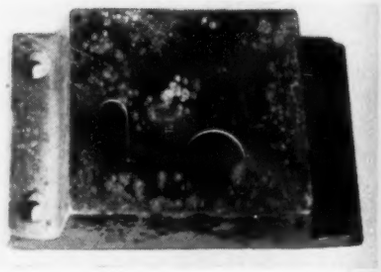
■ ALTHOUGH certain clear lacquers can be used indiscriminately with apparently good results, it is rarely good practice to use such general purpose lacquers as they are apt to be unnecessarily expensive.

As an example, lacquer for silver must be so clear as to be invisible when applied to the surface of the metal and thus commands a higher price. Also it provides an excellent-appearing finish for brass, bronze or copper. But why go to the expense of using a perfectly clear high-priced lacquer for these metals? On the other hand, if a lacquer intended for bronze is used on silver, it is likely to color the metal slightly, thereby decreasing the quality appearance of the product.

Again, a lacquer that gives good results on solid brass or copper products may be utterly unsuited for finishing products plated with these same metals. The reason for this is that the plated coating invariably carries in its pores traces of the plating-bath salts. These residual salts cannot be removed completely by rinsing, no matter how carefully done or how often repeated. Unless something is done to prevent their action, they will sooner or later absorb moisture and form a solution which spreads over the surface of the product, causing what is known as "stain spotting."

Bake Valuable

To combat stain spotting, great care has been taken at every step in plating and finishing. Details vary with products and processes, but the following precautions have been found important: Make the product out of a compact base metal. Keep the free cyanide in the plating bath as low as possible. Encourage stains to form by allowing the products to remain over night in a humid atmosphere after plating, then remove them by scratch-brushing or other methods. Also of value is a 250-degree bake after plating and rinsing. This dries out the salts and renders them less liable to absorb moisture.



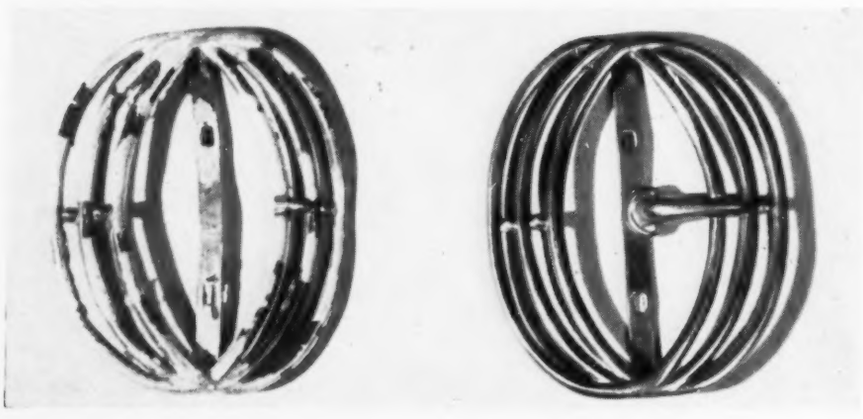
Brass-plated malleable-iron lock part badly stain spotted because lacquer is being attacked by traces of chemicals used in brass plating

The last and possibly most important line of defense against stain spotting in the use of lacquers specially developed for finishing brass and copper plated goods. These lacquers contain compounds that resist the action of the salt traces remaining in the metal pores and thus counteract the tendency for stains to form.

If the plated products are baked after plating and can be lacquered immediately on cooling, they can be finished with a "non-stain-spot" lacquer which gives a fine, durable finish suitable for either indoor or outdoor use.

When the products are not baked,

Abstracted from address delivered before Springfield, Mass., branch of American Electro-Platers' Society



Oxidized silver belt buckle with lacquer peeling off. Same buckle finished with correct lacquer shown at right. Photos courtesy McGraw-Hill Studio

Shell engineers let their quenching oil talk for itself at this forging plant

THE forging plant of the Berridge Shear Company, of Sturgis, Michigan, was up against a problem of quenching oil.

After having used expensive compounded quenching oil for years, this company began experimenting with a straight mineral oil to cut down costs.

Results were far from satisfactory. Using a Heppenstall Grade C annealed block, it was found that it was impossible to obtain any degree of uniformity. While one set of blocks would be exactly right—the next set would be 10 to 20 points softer.

At the time the Shell representative called on this company, they had about decided to go back to the old, high-priced quenching oil. The Shell engineer made a thorough examination of equipment and methods and then *laid his cards on the table.* He would harden a set of dies with the proper quenching oil. If the results were satisfactory, the oil was to remain in their tanks until their own men were convinced of its superiority. If the oil was not satisfactory—it would be removed at once.

Let the Berridge Shear Company tell the results: "After using this oil one year without change, except the addition of new oil to replenish, it was analyzed and found to contain the same properties in the same proportions as when it was originally placed in the tanks. It has proved to be a superior product . . . it also proves that we have learned by experience to take advantage of the excellent services rendered by the Shell engineer."

Case History No. /213 from the Shell files needs little comment—it speaks for itself. The point to remember is this. Shell engineers applied a "plus" in lubrication to this problem—engineering skill combined with fine products. That "plus" is always ready to serve you. Simply call or write your nearest Shell office.

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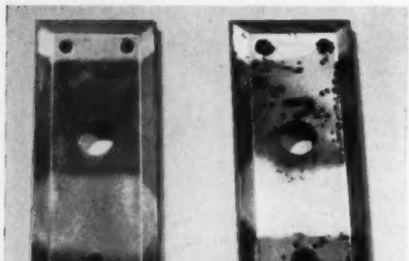


Oxidized-copper door plates coated with an ineffective lacquer. At left, weather has broken down film at screw holes and along edges. Other plate has film unable to withstand chemical action of copper sulphide

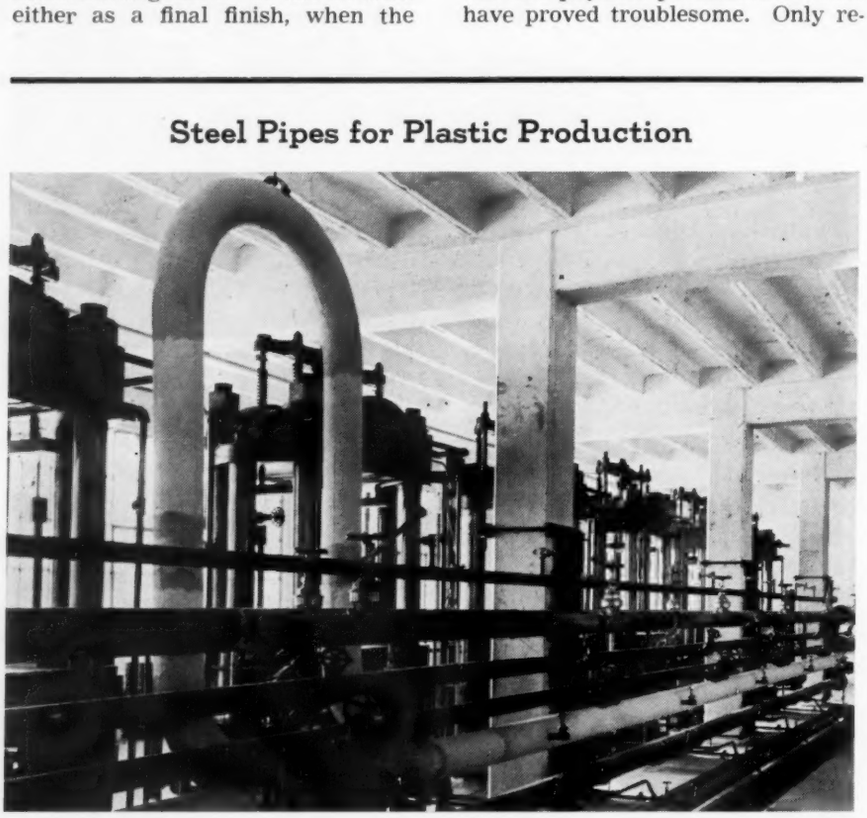
they may be dipped in "water-dip" lacquer immediately after the final rinsing and while they are still wet, as this lacquer has the property of displacing water on a wet surface. It forms a coating that seals the pores and retards the action of the stain-forming salts. It can be used either as a final finish, when the appearance of the product is not extremely important, or as the foundation for a better finish. In the latter case, products need not be given the final finish immediately as the water-dip lacquer provides protection against spotting.

As yet, there is no complete remedy for stain spotting. Stains will appear occasionally in spite of every possible precaution, though with care the trouble can be reduced to a point where not troublesome.

Special lacquers also must be used for products, whether plated or solid, that have "oxidized" finishes; that is, dark finishes produced by treatment with sulphur solutions. Such finishes are subject to what is known as "crystal spotting," caused by reaction of sulphur either in the air or the packing materials. Care in handling and packing oxidized products will minimize crystal spotting while they are in the maker's hands. After shipping, they can be protected from this defect only by lacquers especially designed to inhibit formation of these spots.

For each of the following metals —aluminum, zinc, magnesium, cadmium, chromium, and their alloys —a specially developed finish must be used. These metals have chemical and physical peculiarities which have proved troublesome. Only recently have some of the problems thus presented been solved. However, satisfactory finishes, both clear and pigmented, can be obtained now for all of these metals.

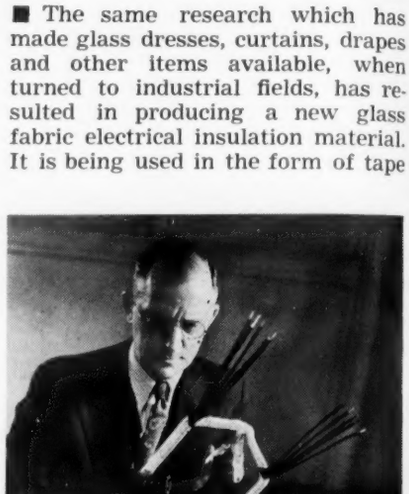
Steel Pipes for Plastic Production



■ **Steel and steel pipe play an important part in the production of molded plastics. About 100,000 pounds of lap-welded and seamless pipe were used in the piping construction for 20 hydraulic molding presses in the new plant of Reynolds Molded Plastics division, Reynolds Spring Co., Jackson, Mich. The plant which opened recently, is in Cambridge, O., and will be devoted to the exclusive manufacture of molded plastics**

Glass Insulation Is Used In Motor Windings

■ The same research which has made glass dresses, curtains, drapes and other items available, when turned to industrial fields, has resulted in producing a new glass fabric electrical insulation material. It is being used in the form of tape



Glass-fabric tape, used to insulate electric motors, is unaffected by excessive heat or moisture. This greatly prolongs motor life

on motor windings. Tests on motors carrying heavy overloads and operating at high temperatures indicate this tape, made from strands of pure glass withstands severe operating conditions.

This development promises to be of particular significance to the hot metalworking industries as the material will survive high temperatures without losing its mechanical strength. The accompanying illustration shows H. R. Meyer, transportation department, Westinghouse Electric & Mfg. Co., holding a blow torch against the windings of a coil insulated with glass tape to prove that it is fireproof.

Other reasons why this tape is adding to the life of motors and helping keep them out of repair shops are that it does not rot, mildew or decay; it is moisture and acid proof.

The tape is available in several widths and in thicknesses as low as 0.005-inch. A number of coils insulated with this tape already have been installed in mine motors, motors on street cars and electric locomotives.

Welding by Friction

(*Concluded from Page 65*)

these machines being set in line adjacent to one another. Two other workmen load and unload the fixtures. Since time for each step in these operations is about the same, rapid continuous production is obtained.

Patents have been issued covering machines, processes and products described above.

When manifolds were exposed on outside of ranges, they were polished and nickel plated. Modern ranges have manifolds concealed inside so only a protecting finish is required, not one for appearance. Manifolds are hung on hooks from racks which travel on a closed monorail system from loading station, over dip tanks, through baking oven and to unloading station.

Procedure in applying the finish is as follows: After loading on racks, work is moved on monorail to elevator section over the tanks. Here elevator section first lowers work into cleaning solution where chips, dirt and oil are removed. Second tank is a rinse and third contains japan, applied by dipping. This is a very thin type, used mainly to protect the steel and keep it clean while it is being handled prior to installation in a range. It does not clog threads in the tapped holes.

After dipping, work is moved on the monorail into the baking oven seen at extreme left in Fig. 7 where it remains ½ hour at 350 degrees. Doors at both ends permit batches to be loaded in at one end and removed at the other. Manifolds are packed in strong fibre cartons, 10 to 50 per carton.

Machines and operations are arranged to eliminate back tracking so work moves roughly in a circle from stockroom to ending machine; bending equipment; drill, expand and tap machines; japanning department; and shipping room.

A rigid inspection schedule is enforced as manifolds must meet accurately other dimension in the ranges. Total length, angle of bends, distance between holes, number of threads, etc., are checked on each piece. Jigs and fixtures are designed especially to aid accurate work. As size of pipe may vary 0.010-inch either way, these checks are necessary to assure a uniform product.

♦

Publishes Enamel Booklet

■ Proceedings of the second forum of the Porcelain Enamel institute held at Ohio State university, Columbus, O., Oct. 13-15, 1937, together with the twenty papers presented at this meeting which covered all phases of enamel shop work have been made available by the institute.

Included is the revised "Definitions of Porcelain Enamel Terms," compiled under the auspices of the technical research section of the institute. Copies of the proceedings are being offered at $2 each. Orders should be sent to the Porcelain Enamel Institute Inc., 612 North Michigan avenue, Chicago.

Steel Utilized in Steering Wheels

■ A recently developed accessory which is now appearing as standard equipment on a number of automobiles is the combination molded plastic and stainless steel banjo-type steering wheel. Rim of the wheel is a cellulose acetate plastic molded over a steel core. It is held to the hub by three sets of stainless steel wires, each set comprising usually five parallel wires of about 3/16-inch diameter.

Since the strength of the wheel is controlled entirely by these spoke wires and since a certain amount of flexibility in them is essential, special properties had to be developed in the steel used for this purpose. One type used is Halcomb stainless iron No. 122 with the following alalysis:

Carbon	0.12 max.
Manganese	0.45 approx.
Silicon	0.40 approx.
Nickel	2.00 approx.
Chromiom	14.00 approx.

Produced by the Crucible Steel Co. of America, the material is cold melt electric furnace steel, hot rolled in coils and then cold drawn to near the finish size, when it is heat treated to show a tensile strength of approximately 220,000 pounds per square inch.

Accompanying this high tensile strength, must be sufficient ductility to permit a bend of 180 degrees around ¼-inch diameter without breaking. This is important, since the wheels have been designed to avoid wire fractures when struck in a collision, to prevent impaling a driver on one of the broken wires.

The wire is furnished in both satin and luster finishes. The satin finish is obtained by grinding and then finishing with a finer grain belt polish. The luster finish is ground, finished on a finer grit belt and then put through hardened surfacing rolls which burnish the surface and give a high luster on the wire.

Hub of the wheel is a zinc-base die casting, chromium plated. Inside the hub is fitted snugly a steel ring, drilled to receive the spoke wires, each one of which is welded to this reinforcing ring. The wires likewise pass through holes drilled in the outer steel core ring, and are welded to the latter before the plastic "tire" is molded over it.

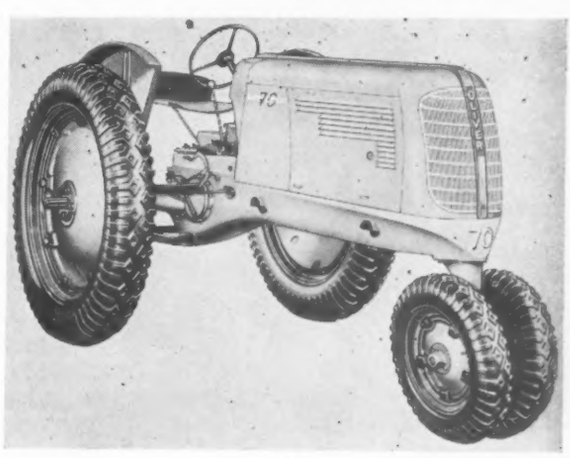
This type of decorative steering wheel is said to have originated in England some years ago and was introduced as a novelty in this country about five year ago. Since that time it has made rapid strides and is now practically standard equipment on a number of deluxe lines and even on some standard lines.

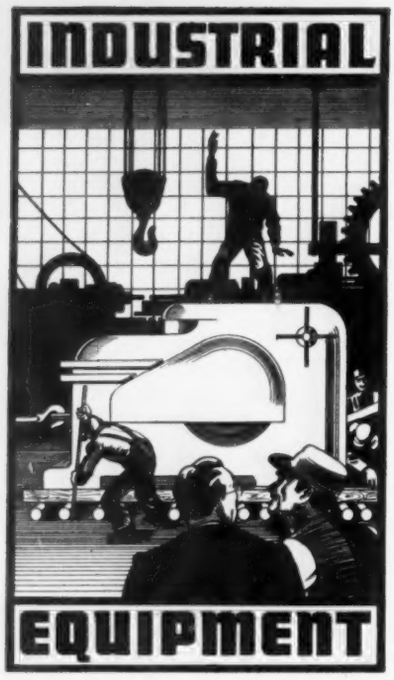
Naturally there have been a number of design variations worked out for different cars. In one case the spoke wires are stepped-down midway between rim and hub to permit a horn ring to be mounted flush with the plane of the wheel. Other designs use only three or four wires per spoke.

There have been some objections to brilliant finish on the spoke wires and the hub because at times they will reflect sunlight into the driver's eyes and interfere with his vision. To get around this difficulty spokes are satin finished and the hub is either painted or given a dull finish.

A Friend to Trees and Shrubs

■ **Protruding top elements such as radiator and gasoline caps have been placed under a channel section in this new tractor designed by Wilbur Henry Adams, Cleveland, and manufactured by Oliver Farm Equipment Co., Chicago. Appearance has been improved and the tractor better fitted for orchard work**





Rubber Buckets For Corrosive Acids

■ B. F. Goodrich Co., Akron, O., has introduced a Flexite acid bucket which is so constructed as to provide greater safety to workmen handling corrosive liquids.

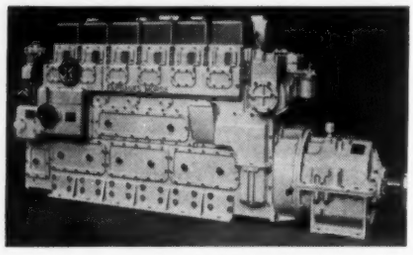
Bucket is made of semiflexible material which will not crack or break under normal use. Reinforced bead on the base is not only enlarged but recessed to permit the worker to get a firm hold with his gloved hands. As a safety precaution against spillage, a capacity scale is molded on the inside of the bucket. This also serves to measure quantities of liquid accurately.

The buckets are available only in the 3-gallon size. They weigh 3½ pounds, and are equipped with steel or metal reinforced hard rubber handles.

New Type Engines For Stationary Service

■ Fairbanks-Morse & Co., 600 South Michigan avenue, Chicago, has placed on the market a series of 4-cycle, vertical, convertible diesel and gasoline engines for stationary service. The former also is offered for marine propulsion and complete, unit-built generating sets as well.

These motors are built in both six and eight cylinder combinations, with 8-inch bore and 10½-inch stroke.



They develop 35 horsepower per cylinder at 720 revolutions per minute. A smaller sized diesel engine of 8 horsepower per cylinder also is available.

The diesels for marine service are direct-reversible, but can be furnished as non-reversible where required. Enbloc construction is employed on these power plants, with individual cylinder liners, precision main, connecting rod and camshaft bearings, and suspended or underslung crankshaft. Side cover plates permit easy accessibility to main and connecting rod bearings. Design of motors permit double-end drive or power take-off at either end.

Camshaft Tester Facilitates Calculations

■ Carl Zeiss Inc., 485 Fifth avenue, New York, has placed on the market an improved camshaft tester designed to provide a rapid, high precision means for determining the form and angular relation of the lobes of cams of all kinds.

Direct readings may be made on the glass master scale and spiral optical vernier to 0.00005 inches. An additional improvement is a means for setting the master scale to zero or to a round figure, thus facilitating calculations.

Extremely Heavy Loads Handled by Die Truck

■ Service Caster & Truck Co., 640 North Brownswood avenue, Albion, Mich., has placed on the market a power drawn die truck for transporting automotive body dies as high as two and three stories.

Although the truck platform covers an area of only 6 x 6 feet it will easily handle loads up to thirty tons. It is equipped with six large wheels 12 inches in diameter with a 5-inch tread, and two swivel casters, under the front corners, are swung with 4 x 4-inch wheels. These two

corner wheels are normally off the floor, installed as a safety measure to catch the loaded truck, should it tip in one direction or another. All wheels are fabricated of iron with turn-over Hyatt bearings inserted. The truck is available in various sizes.

Sand Conditioner Has Larger Capacity

■ Beardsley & Piper Co., 2541 North Keeler avenue Chicago, has introduced a larger model Speedmullor for capacities suitable in large foundries. It is said to have a sand conditioning capacity of 50 to 75 tons per hour.

The unit employs three large rubber-covered mulling balls in place of the two formerly used. The bowl is made in segments and is so built that it is easily rotated as a whole on the base to allow for any position of the sand discharge gate. Three inside and three outside plows are provided for delivering the sand

outwardly, inwardly and upwardly, and for holding the sand in suspension in the path of the mullor balls during the operating cycle. The unit is known as model 24-83.

Larger Capacities Concentrated in Unit

■ Wm. W. Nugent & Co., 410 North Hermitage street, Chicago, has placed on the market a larger size pressure oil filter to concentrate large capacities in one unit.

Filter is constructed of steel plate and welded steel castings to with-

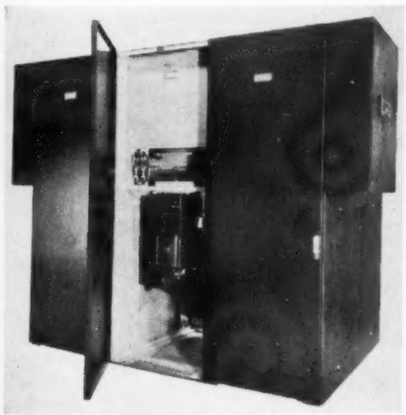
stand a working pressure of 100 pounds pressure per square inch. Operation is similar to previous filters, the outstanding difference being eight filter bag elements wound around the central spool instead of four.

The unit can be obtained in overall sizes from 21 to 43 inches, with flanged pipe thread inlets and outlets from 1½ to 2½ inches. Filtering surface is claimed to be 20 times more than most filters for the space occupied.

Builds Extension of Enclosed Switchgear

■ Delta-Star Electric Co., 2400 Fulton street, Chicago, has placed on the market an extension of the vertical lift unit type metal enclosed switchgear for industrial or powerhouse applications.

Unit incorporates oil circuit breaker ratings up to and including 15 kilovolts, 2000 amperes with an



interrupting capacity of 500,000 kilovolt amperes. Special cable connecting compartments are built into the ends of the gear to accommodate temporary cable taps from the main bus. Other units may be added to either end.

Flexible Coupling Has Larger Housing

■ Link-Belt Co., 307 North Michigan avenue, Chicago, has placed on the market an improved flexible coupling, type RCB, which embodies major improvements for connecting shafting in line.

The coupling consists of two cut tooth sprocket wheels which are connected by a piece of single-width finished steel roller chain using a recently patented, divided roller feature which combines the advantage of double roller chain with the construction of single width chain.

This divided roller provides independent roller action for each sprocket, and as the contact between roller and sprocket causes roller to revolve on its bushing, any tendency to scuff the rollers and sprocket teeth is avoided.

Other improvements concern the grease-retaining housing which, when specified is furnished for enclosure and automatic lubrication of the coupling. Another feature is the use of two fittings, 180 degrees

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apart, inside the housing to permit packing the housing with grease without dismantling. To embody these changes the housing size has been slightly increased.

Pump Is Mounted on Surface of Machine

■ Pioneer Engineering & Mfg. Co., 31 Melbourne avenue, Detroit has placed on the market a Rollway machine pump, function of which is to lubricate bearings, gears, multiple spindle drill heads and other similar units.

Unit is small and compactly built. It can be mounted on practically any flat surface of the machine assembly. All moving parts of the pump are made of hardened steel and accurately ground to close tolerances. As the driving gear is inside the machine, no gland is needed.

As mounted against the outer surface of the machine it may be connected without disturbing either pipe lines or driving gears. Inlet and outlet ports through the machine casting are permanently connected with discharge and supply piping inside. This ASE model is a high vacuum unit which delivers liquid immediately after rotation is started. Stopping or reversing the machine has no effect on pump operation.

Automatic Buffing Unit Handles Intricate Pieces

■ Shakespeare Products Co., Kalamazoo, Mich., has introduced an automatic buffing machine which takes the work straight into the buffing wheel with equal pressures on all important surfaces.

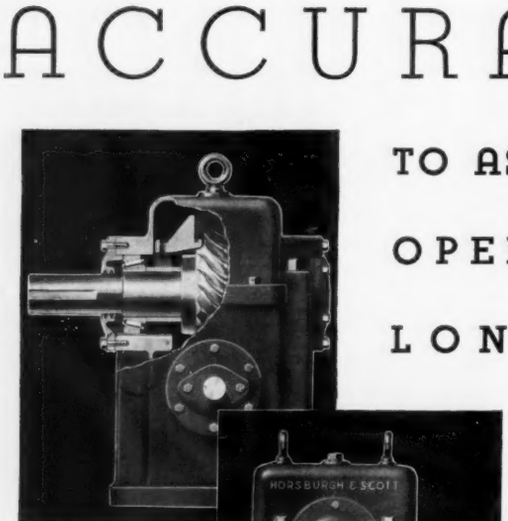
This feature is said to enable contour buffing of soft metals and plastic materials as well as hard buffing of steel and brass parts. Only 15 minutes is required to set up the machine for the particular product to be buffed. Work which was uneconomical to buff even by hand is claimed to be adequately handled by the new unit.

Scale and Lift Truck Are Built Integral

■ Barrett-Cravens Co., 3255 West Thirtieth street, Chicago, has introduced a combination scale and lift truck which in addition to weighing, counting or measuring skid loads, will handle other tasks in the plant.

The truck is available in single or multiple types with capacities ranging from 3500 to 5000 pounds. The design of the unit permits the installation of the scale truck for use with any type or make of skids having a minimum underclearance of 7½ inches. The weighing platform of the truck is from 19 to 25 inches wide, and the length is available in sizes of 36, 42, 48, and 54 inches. Wheels are 6, 7 and 9 inches in diameter and equipped with either roller or ball bearings. Many of the features incorporated in the regular lift trucks are included in this unit including hydraulic release, low turntable and spring handle holdup.

ACCURATE...



TO ASSURE SMOOTH OPERATION AND LONG LIFE....

for right-angle drives in ratios up to 100 to 1

Horsburgh & Scott Worm Gear Speed Reducers represent the most advanced engineering practice . . . the highest type of precision manufacture. They are simple . . . exceptionally compact. Housings are oiltight . . . dustproof. Hardened and ground worms, accurately generated gears, accurate alignment and extra heavy-duty bearings assure long life, with efficiencies reaching as high as 98%.

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THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVENUE, CLEVELAND, OHIO, U. S. A.

Foundry Cost Systems Show Basic Similarity

(*Concluded from page* 40)

individual foundries could be remedied by attention to four factors of which the first was to obtain an occupational record of all workers since their beginning of work; second, adequate medical examination; third, have X-ray photographs taken according to acceptable principles; and fourth, conduct a careful engineering survey of working conditions.

W. J. Grede, Liberty Foundry Co., Wauwatosa, Wis., asked if there was any relation between age groups and exposure in foundries to that of general population, and the reply was that in all cases there was a close parallel. Dr. White, Chicago, presented some figures which agreed closely to those of Dr. Greenburg. He said that he found that for fibrosis the percentage to be 5.4 per cent, and for silicosis, 1.8 per cent, as compared with 4.5 per cent and 2.4 per cent, respectively, and that the slight difference might be attributed to the fact that he constituted the reviewer instead of 5 different individuals as mentioned in Dr. Greenburg's report.

He said that he believed workers who continually were subject to colds and other respiratory diseases were most susceptible to fibrosis and silicosis. Hence, such workers should not be exposed to any dust hazard. He also said he believed that further study of the various problems might result in methods of picking the man for the job, rather than the present other way about.

Machine Tools

(*Concluded from page* 39)

These are hardened and ground and positioned accurately. Thus it is a simple matter to get the center distances for the holes to be bored from these guides.

Spindles for these machines are hot rolled bar stock and the first operation consists of boring them with a hog nose drill. This operation is shown in Fig. 7. The machine employed is a turret lathe with the turret removed. In its place is mounted a support for carrying the drill or boring bar. As the illustration shows, this drill is fitted with a flexible hose so that lubricant is pumped constantly through the bar to the cutting tools.

One end of the stock to be bored is gripped in a 3-jaw chuck on the headstock spindle. The other end is clamped in a cathead which runs in a steady rest. This results in a very secure support so that the drill can be forced to maximum capacity, which would not be the case if the stock were located in an ordinary 3-jaw backrest as in common machine shop practice. These spindles are made in various sizes to accommodate different machines. The stock in position in the machine in Fig. 7 is 29 inches long and 5⅝ inches diameter, while the bored hole is 3½ inches in diameter.

In making the various components for these machines it is obvious that a large amount of engine lathe work is involved. The operation shown in Fig. 8 consists of boring a taper seat in a spindle end. One end of the spindle is held as shown against the faceplate of a 36-inch engine lathe while the other end runs in a 3-jaw backrest. The boring tool is located on the compound rest and fed by hand. The outer diameter of this hole is 5½ inches. The seat thus formed will be ground accurately after the spindle has been heat treated and this seat will accommodate the collet chuck in which the stock is gripped. Where only a few spindles of a given size are going through production at a time no better method of finishing has been devised.

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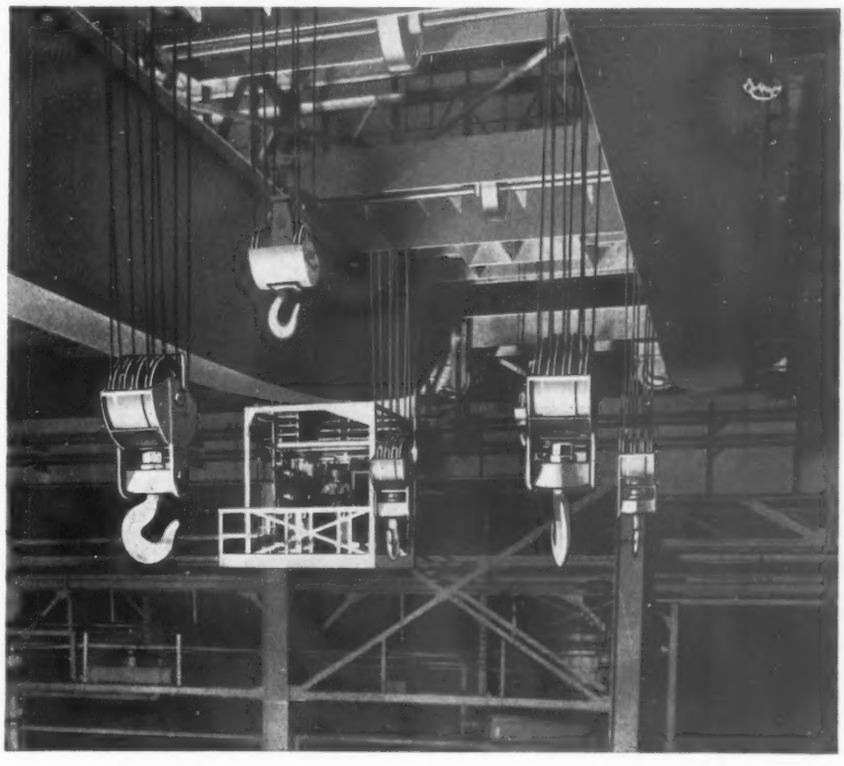

• Looking up at the four main 50 ton hooks and the two 15 ton auxiliary hooks of a 200 ton, 100 foot span all welded Cleveland Crane.

ALSO BUILDERS OF

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THE CLEVELAND CRANE & ENGINEERING CO

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NEW YORK • DETROIT PITTSBURGH • CHICAGO

MATERIALS HANDLING EQUIPMENT

Dual-Use Box Skids

(*Concluded from page* 48)

and bushings are assembled on a special press with a floating bed to equalize pressure.

When completed, a tractor is supplied with a small quantity of gasoline and moves under its own power from assembly through testing and painting to temporary storage or to shipment. To paint the track, almost half of which rests on the floor, tractor is fastened to a hook in circular platform of spray booth. Engine then is started and track painted while in motion.

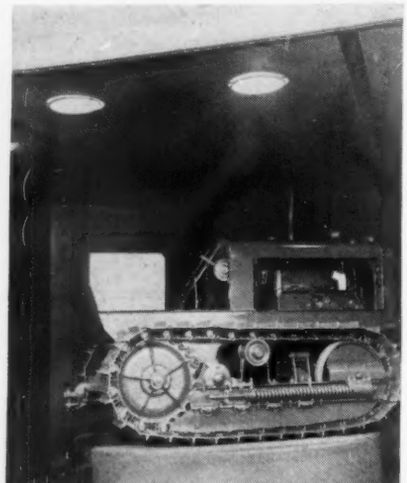

Fig. 4—Spray-booth platform elevates and rotates to facilitate painting work

Principal objective in development of handling equipment is to guard the health and safety of employes. Spray booths for painting tractors are enclosed on three sides and top, with exhaust openings at rear near the floor. Exhausted paint fumes and spray pass through water-washed filters so no paint is discharged into the atmosphere. Tractors are driven up on platforms which rotate and elevate so operator can paint entire tractor while standing in front part of booth as shown in Fig. 4. All paint-laden air is drawn away from him by exhaust fans. Gasoline, engine oil and paint are pumped to desired points in the building.

Finding True Costs

(*Concluded from page* 42)

a 300 per cent increase in production life. In another case costs decreased from 12 to 14 cents per ton using a third-quality cheap belt to from 2 to 4 cents per ton produced when using a high-grade first-quality belt.

Ultimate belt costs can be determined only if complete records are kept of original cost as well as expense of installation, maintenance, repairs, and production records for the time in use. Many companies keep such records on at least two or three types of belts on different machines engaged in the same work to test belt life cost and production. From these records the costs of various belts are compared and the best belt then is adopted as standard for that and similar types of machines and production. Such records seldom are comparable on machines engaged in producing a variety of different items. Many belt manufacturers will supply belt record cards on request.

To identify machine drives on test the maintenance department in one automotive plant has a tag of a distinctive color attached conspicuously to the machine. This gives the number of machine and of the belt test. The mill wright reports individually all work performed on each of these drives. Other belt work is reported and charged by departments. Production records are obtained from the production department. In this plant large numbers of machines are engaged in identical work so comparable tests are easily obtained and the belt giving the best results selected. On work or machines where the belt is under especially severe operating conditions, as on gear cutters, the policy of the plant engineer is to test any new type of belt offered whenever he is convinced that it may give any improvement or cost reduction.

Malleable Iron Camshafts Are Surface Hardened

■ Speaking before a malleable cast iron session at the recent convention of the American Foundrymen's association in Cleveland, W. E. Benninghoff, Ohio Crankshaft Co., Cleveland, presented a paper, "Pearlitic Malleable—Tocco Hardened," in which he described equipment and process for surface hardening malleable iron camshafts. By this process, surfaces to be hardened are heated electrically and then quenched with a water spray.

In a mention of Mr. Benninghoff's paper in STEEL for May 30, page 47, camshafts were inadvertently referred to as crankshafts. The statement should have read: "With proper equipment, the speaker asserted a workman can harden 60 camshafts per hour."

Paper Emphasizes Design

■ Many users of steel castings as well as makers will be interested in the paper, "Influence of Design on the Stress Resistance of Steel Castings," by the late R. A. Bull and published as reprint No. 37-35 by the American Foundrymen's association, 222 West Adams street, Chicago.

With 22 illustrations and 62 pages, the subject is covered from many angles. The author assembled and evaluated such data as might be helpful from a large number of sources.

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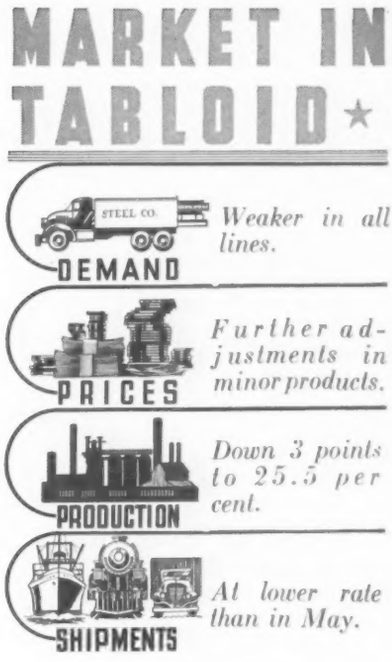
Steel Demand Lags as Market Enters Summer

Pig Iron Output Off; Scrap at New Low; Mill Pace Less



■ ALL indications in the steel industry point to continued dullness and no factors have appeared to furnish a basis for expectation of improvement.

Consumers consistently refrain from making commitments beyond immediate needs and light buying now being done is patently for completing broken assortments. Practically complete absence of automotive and railroad buying, usually important supports, accompanied by much less than normal demand for structural steel, not only removes large tonnage demand but collateral industries depending on these for outlet are also held back. Automobile and railroad accessory manufacturers find little business except for repairs and replacements.

Steelmakers are also suffering from delays in government approval of contracts for cargo ships and railroad cars purchased under loans. A considerable tonnage of plates and other steel is thus held back from mills.

Pig iron production in May declined 12 per cent in daily rate and 9.2 per cent in total tonnage. These figures represent the smallest month in total output and daily rate since December, 1934, and the smallest May since 1933. Active stacks at the end of May numbered 73, compared with 79 at the end of April and with 170 for May, 1937. The daily rate of production in May was 40,675 gross tons, compared with 46,267 tons in April, a loss of 5592 tons. Total production in May was 1,260,937 tons, compared with 1,338,008 tons in April, a difference of 127,071 tons. Total production in May, 1937, was 3,545,180 tons. Five months' production this year aggregates 6,870,351 tons, compared with 16,656,033 in the corresponding period of 1937.

Operations last week declined 3 points to 25.5 per cent, largely the result of Pittsburgh and Chicago mills making reductions of several points, while other centers showed little change. Pittsburgh lost 4 points to 18 per cent, Chicago 6.5 to 22.5 per cent, Eastern Pennsylvania 1 point to 26, Wheeling 3 points to 38, New England 3 points to 27, Cincinnati 6 points to 22 and Youngstown 6 points to 21. St. Louis showed a gain of 6 points to 39.3 and Cleveland 5 points to 31. There was no change at Buffalo at 21 per cent, Birmingham at 69 and Detroit at 18.

Following general reaffirmation of prices for third quarter producers are making further announcements clearing up various products not included in the first schedules. Bolt and nut prices will remain unchanged Commodity strip has been placed on a new base at $2 per ton lower than formerly, with a new list of extras and deductions. Announcement on galvanized sheets is expected to be made at once, with probability of no change in price but an adjustment in functional discount. Possible adjustments in reinforcing bar prices may be made to meet special conditions in that product.

Slight increase in activity by railroads is evident, freight cars bought in May totaling 6014 units, the largest month's business since April last year. A number of inquiries and orders for small lots of cars and locomotives provide some business. Steel has not been placed with mills for the Southern railway cars, due to delay in approval of the order by the interstate commerce commission.

Automobile assemblies last week declined 18,140 units from the preceding week to a total of 26,980, slightly more than one-fourth the output in the corresponding week last year when 101,779 units were produced. General Motors made 15,650 last week, against 20,300 the week before; Ford dropped sharply to 2000, compared with 12,760; Chrysler assembled 5475 compared with 7000. Independents made 3855, against 5060.

After apparently reaching a bottom in May scrap prices declined sharply last week, steelmaking grades at all important centers losing about 50 cents. The composite price reflected this by dropping to $10.75, a loss of 58 cents from the previous week. Weakness in scrap caused the iron and steel composite to lose 6 cents, to $38.38 on the basis of second quarter quotations and to $37.55 on third quarter bases. The finished steel composite is steady at $61.70 for second quarter and $59.80 on the new bases.

COMPOSITE MARKET AVERAGES

	June 4	May 28	May 21	One Month Ago May, 1938	Three Months Ago March, 1938	One Year Ago June, 1937	Five Years Ago June, 1933
Iron and Steel	$38.38	$38.44	$38.50	$38.50	$38.80	$39.82	$28.71
Finished Steel	61.70	61.70	61.70	61.70	61.70	61.70	45.30
Steelworks Scrap..	10.75	11.33	11.37	11.47	13.20	17.15	9.55

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	June 4, 1938	May 1938	March 1938	June 1937
Steel bars, Pittsburgh	2.45c	2.45c	2.45c	2.45c
Steel bars, Chicago	2.50	2.50	2.50	2.50
Steel bars, Philadelphia	2.77	2.75	2.75	2.74
Iron bars, Terre Haute, Ind.	2.35	2.35	2.35	2.35
Shapes, Pittsburgh	2.25	2.25	2.25	2.25
Shapes, Philadelphia	2.465	2.465	2.465	2.455
Shapes, Chicago	2.30	2.30	2.30	2.30
Tank plates, Pittsburgh	2.25	2.25	2.25	2.25
Tank plates, Philadelphia	2.445	2.445	2.445	2.435
Tank plates, Chicago	2.30	2.30	2.30	2.30
Sheets, No. 10, hot rolled, Pitts.	2.40	2.40	2.40	2.40
Sheets, No. 24, hot ann., Pitts.	3.15	3.15	3.15	3.15
Sheets, No. 24, galv., Pitts.	3.80	3.80	3.80	3.80
Sheets, No. 10, hot rolled, Gary	2.50	2.50	2.50	2.50
Sheets, No. 24, hot anneal., Gary	3.25	3.25	3.25	3.25
Sheets, No. 24, galvan., Gary	3.90	3.90	3.90	3.90
Plain wire, Pittsburgh	2.90	2.90	2.90	2.90
Tin plate, per base box, Pitts.	$5.35	$5.35	$5.35	$5.35
Wire nails, Pittsburgh	2.75	2.75	2.75	2.75

Semifinished Material

Sheet bars, open-hearth, Youngs.	$37.00	$37.00	$37.00	$37.00
Sheet bars, open-hearth, Pitts.	37.00	37.00	37.00	37.00
Billets, open-hearth, Pittsburgh	37.00	37.00	37.00	37.00
Wire rods, No. 5 to 9/32-inch, Pitts.	47.00	47.00	47.00	47.00

Pig Iron

	June 4, 1938	May 1938	March 1938	June 1937
Bessemer, del. Pittsburgh	$25.34	$25.34	$25.26	$25.26
Basic, Valley	23.50	23.50	23.50	23.50
Basic, eastern del. East. Pa.	25.34	25.34	25.34	25.26
No. 2 foundry, Pittsburgh	25.21	25.21	25.21	25.21
No. 2 foundry, Chicago	24.00	24.00	24.00	24.00
Southern No. 2, Birmingham	20.38	20.38	20.38	20.38
Southern No. 2, del. Cincinnati	23.89	23.89	23.89	23.69
No. 2X eastern, del. Philadelphia	26.215	26.215	26.215	26.135
Malleable Valley	24.00	24.00	24.00	24.00
Malleable, Chicago	24.00	24.00	24.00	24.00
Lake Sup., charcoal, del. Chicago	30.34	30.34	30.24	30.04
Gray forge, del. Pittsburgh	24.17	24.17	24.17	24.17
Ferromanganese, del. Pittsburgh	107.77	107.77	107.49	107.29

Scrap

Heavy melting steel, Pittsburgh	$10.75	$11.55	$13.65	$18.40
Heavy melt. steel, No. 2, E. Pa.	9.75	10.00	12.75	15.25
Heavy melting steel, Chicago	10.25	11.05	12.20	16.00
Rails for rolling, Chicago	14.75	14.85	15.25	19.50
Railroad steel specialties, Chicago	13.25	13.60	14.25	19.50

Coke

Connellsville, furnace, ovens	$4.25	$4.25	$4.25	$4.65
Connellsville, foundry, ovens	5.25	5.25	5.25	5.30
Chicago, by-product foundry, del.	11.00	11.00	11.00	11.00

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Base prices, subject to new extras and deductions, effective to Sept. 30, 1938.

Hot sheet, strip, Pitts.	2.30c
Do., Gary	2.40c
Tin mill black, Pitts.	3.30c
Do., Gary	3.40c
Cold-rolled sheets, Pitts.	3.35c
Do., Gary	3.45c
Cold-roll. strip, Pitts.	3.10c
Do., Worcester, Mass.	3.30c

Prices below also apply until June 30, with old extras and deductions, if giving lower net price.

Hot Rolled No. 10, 24-48 in.

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, del.	2.60c
New York, del.	2.76c
Philadelphia, del.	2.72c
Birmingham	2.47½c
St. Louis, del.	2.63c
Granite City, Ill.	2.60c
Pac. base pts. f.o.b. cars, dock,	2.95c

Galvanized No. 24

Pittsburgh	3.80c
Gary	3.90c
Chicago, delivered	3.93c
Philadelphia, del.	4.12c
New York, delivered	4.16c
Birmingham	3.95c
St. Louis, del.	4.03c
Granite City, Ill.	4.00c
Pac. base pts. f.o.b. cars, dock,	4.40c

Tin Mill Black No. 28

Pittsburgh	3.30c
Gary	3.40c
St. Louis, delivered	3.53c
Granite City, Ill.	3.50c

Cold Rolled No. 10

Pittsburgh	3.00c
Gary	3.10c
Detroit, delivered	3.20c
Philadelphia, del.	3.32c
New York, del.	3.36c
St. Louis, del.	3.23c
Granite City, Ill.	3.20c
Pac. base pts. f.o.b. cars, dock,	3.60c

Cold Rolled No. 20

Pittsburgh	3.45c
Gary	3.55c
Detroit, delivered	3.65c
Philadelphia, del.	3.77c
New York, del.	3.81c
St. Louis	3.68c
Granite City, Ill.	3.65c

Enameling Sheets

Pittsburgh, No. 10	2.90c
Pittsburgh, No. 20	3.50c
Gary, No. 10	3.00c
Gary, No. 20	3.60c
St. Louis, No. 10	3.13c
St. Louis, No. 20	3.73c

Tin and Terne Plate

Gary base, 10 cents higher

Tin plate, coke (base box) Pittsburgh	$5.35
Waste-waste, 2.80c; strip	2.50c
Long ternes, No. 24, unassorted, Pittsburgh	4.10c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold stp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.25c
New York, del.	2.55c
Philadelphia, del.	2.44½c
Boston, delivered	2.68c
Buffalo, delivered	2.49½c
Chicago or Gary	2.30c
Cleveland, del.	2.45½c
Birmingham	2.40c
Coatesville, base	2.35c
Sparrows Pt., base	2.35c
St. Louis, delivered	2.54c
Pacific basing points, f.o.b. cars, dock,	2.80c
Do. floor plates	4.05c

Structural Shapes

Pittsburgh	2.25c
Philadelphia, del.	2.46½c
New York, del.	2.52c
Boston, delivered	2.66c
Bethlehem	2.35c
Chicago	2.30c
Cleveland, del.	2.46c
Buffalo, delivered	2.37½c
Gulf Ports	2.66c
Birmingham	2.40c
St. Louis, del.	2.54c
Pacific coast basing pts., f.o.b. cars dock,	2.80c

Bars

Soft Steel

(Base, 3 to 25 tons)

Pittsburgh	2.45c
Chicago or Gary	2.50c
Duluth	2.60c
Birmingham	2.60c
Cleveland	2.50c
Buffalo	2.55c
Detroit, delivered	2.60c
Philadelphia, del.	2.77c
Boston, delivered	2.89c
New York, del.	2.81c
Pacific coast basing pts., f.o.b. cars, dock,	3.00c

Rail Steel

To Manufacturing Trade

Pittsburgh	2.30c
Chicago or Gary	2.35c
Cleveland	2.35c
Moline, Ill.	2.35c
Buffalo, delivered	2.37½c
Birmingham	2.45c

Iron

Terre Haute, Ind.	2.35c
Chicago	2.40c
Philadelphia	2.67c
Pittsburgh, refined	3.50-8.00c

Reinforcing

New billet, straight lengths, quoted by distributors

Pittsburgh	2.45c
Chicago, Gary, Buffalo, Cleve., Birm., Young.	2.50c
Gulf ports	2.85c
Pacific coast ports, f.o.b. car docks	2.95c
Philadelphia, del.	2.77c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	2.30c
Chicago, Buffalo, Cleveland, Birm., Young.	2.35c
Gulf ports	2.70c

Wire Products

Prices apply to mixed carloads, base; less carloads subject to quantity extras.

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.75
Cement coated nails	$2.75

(Per pound)

Polished staples	3.45c
Galv. fence staples	3.70c
Barbed wire, galv.	3.40c
Annealed fence wire	3.15c
Galv. fence wire	3.55c
Woven wire fencing (base C. L. column)	.74
Single loop bale ties, (base C. L. column)	.63

To Manufacturing Trade

Plain wire, 6-9 ga.	2.90c
Galvanized wire	2.95c

Anderson, Ind. (merchant products only) and Chicago up $1; Duluth and Worcester up $2; Birmingham up $3.

Spring wire, Pittsburgh or Cleveland	3.50c

Do., Chicago up $1, Worc. $2.

Cold-Finished Carbon Bars, Shafting

Pittsburgh	2.90c
Chicago	2.95c
Gary, Ind.	2.95c
Detroit	2.95c
Cleveland	2.95c
Buffalo	3.00c

Subject to quantity deductions and extras. List dated Aug. 26, 1935; revised Oct. 1, 1936.

Alloy Steel Bars (Hot)

(Base, 3 to 25 tons)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 3.00c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo. 0.55

4600 0.20 to 0.30 Mo. 1.50-2.00 Ni. 1.10

5100 0.80-1.10 Cr. 0.45

5100 Cr. spring 0.15

6100 bars 1.20

6100 spring 0.85

Cr. N., Van. 1.50

Carbon Van. 0.85

9200 spring flats 0.15

9200 spring rounds, squares 0.40

Piling

Pittsburgh	2.60c
Chicago, Buffalo	2.70c
Pacific basing pts. f.o.b. cars, dock	3.05c

Strip and Hoops

(Base, hot-rolled, 25-1 ton)
(Base, cold-rolled, 25-3 tons)

Hot strip to 23⅛-in.	
Pittsburgh	2.40c
Chicago or Gary	2.50c
Birmingham base	2.47½c
Detroit, del.	2.60c
Philadelphia, del.	2.72c
New York, del.	2.76c
Cooperage hoop,	
Pittsburgh	2.50c
Chicago	2.60c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland	3.10c
Detroit, del.	3.41c
Worcester, Mass.	3.30c

Carbon	Cleve. Pitts.	Worcester, Mass.
0.26—0.50	3.10c	3.30c
0.51—0.75	4.35c	4.55c
0.76—1.00	6.20c	6.40c
Over 1.00	8.40c	8.60c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$42.50
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pittsburgh, Chicago	$43.00
Do., rerolling quality	42.00
Angle bars, billet, Gary, Pittsburgh, So. Chicago	2.80c
Do., axle steel	2.35c
Spikes, R. R. base	3.15c
Track bolts, base	4.35c
Car axles forged, Pitts., Chgo., B'ham.	3.35c
Tie plates, base	$46.00

Base, light rails 25 to 60 lbs.; 20 lbs. up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists, carloads 5% up:

Carriage and Machine

½ x 6 and smaller	65-5 off
Do. larger, to 1-in.	60-10 off
Do. 1⅛ and 1¼-in.	60-5 off
Tire bolts	50 off

Stove Bolts

In packages with nuts attached 70 off; in packages with nuts separate 70-10 off; in bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	50-10-5 off
Elevator bolts	50-10-5 off

Nuts

S. A. E. semifinished hex.:	
½ to ⅞-inch	60-10 off
Do., ⅞ to 1-inch	60-5 off
Do., over 1-inch	60 off

Hexagon Cap Screws

Milled	50-10 off
Upset, 1-in., smaller	70-5 off

Square Head Set Screws

Upset, 1-in., smaller	80-5 off
Headless set screws	75 off

Rivets, Wrought Washers

Structural, Pittsburgh, Cleveland	3.60c
Structural, Chicago	3.70c
⅞-inch and smaller, Pitts., Chi., Cleve.	65-5 off
Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75	off

Cut Nails

Cut nails, C. L. Pitts. (10% disc. on all extras)	$3.60
Do., less carloads, 5 kegs or more, no discount on any extras	$3.90
Do., under 5 kegs no disc. on any extras	$4.05

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ less. Wrought pipe, Pittsburgh.

Butt Weld

Steel

In.	Blk.	Galv.
½	59½	49
¾	62½	53
1—3	64½	55½

Iron

¾	26	8
1—1¼	30	14
1½	34	16½
2	33½	16

Lap Weld

Steel

2	57	47½
2½—3	60	50½
3½—6	62	52½
7 and 8	61	50½
9 and 10	60½	50
11 and 12	59½	49

Iron

2	26½	10
2½—3½	27½	12½
4	29½	16
4½—8	28½	15
9—12	24½	10

Line Pipe

Steel

1 to 3, butt weld	63½
2, lap weld	56
2½ to 3, lap weld	59
3½ to 6, lap weld	61
7 and 8, lap weld	60
10-inch lap weld	59½
12-inch, lap weld	58½

Iron

	Blk.	Galv.
¾ butt weld	25	7
1 and 1¼ butt weld	29	13
1½ butt weld	33	15½
2 butt weld	32½	15
1½ lap weld	23½	7
2 lap weld	25½	9
2½ to 3½ lap weld	26½	11½
4 lap weld	28½	15
4½ to 8 lap weld	27½	14
9 to 12 lap weld	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet, f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Weld

Sizes	Steel	Charcoal Iron
1½" OD x 13 Ga.	$10.45	$23.71
1¾" OD x 13 Ga.	11.89	22.93
2" OD x 13 Ga.	13.31	19.35
2" OD x 11 Ga.	15.49	23.36
2¼" OD x 13 Ga.	14.82	21.68
2¼" OD x 11 Ga.	17.38	26.02
2½" OD x 12 Ga.	17.82	26.57
2¾" OD x 12 Ga.	18.86	29.00
3" OD x 12 Ga.	19.73	31.36
3½" OD x 11 Ga.	24.89	39.81
4" OD x 10 Ga.	30.81	49.90
5" OD x 9 Ga.	47.57	73.93
6" OD x 7 Ga.	73.25	....

Seamless

	Hot Rolled	Cold Drawn
1" OD x 13 Ga.	$ 8.41	$ 9.46
1¼" OD x 13 Ga.	9.96	11.21
1½" OD x 13 Ga.	11.00	12.38
1¾" OD x 13 Ga.	12.51	14.09
2" OD x 13 Ga.	14.02	15.78
2¼" OD x 13 Ga.	15.63	17.60
2¼" OD x 12 Ga.	17.21	19.37
2½" OD x 12 Ga.	18.89	21.22
2¾" OD x 12 Ga.	19.98	22.49
3" OD x 12 Ga.	20.97	23.60
4½" OD x 10 Ga.	40.15	45.19
3½" OD x 11 Ga.	26.47	29.79
4" OD x 10 Ga.	32.83	36.94
5" OD x 9 Ga.	50.38	56.71
6" OD x 7 Ga.	77.35	87.07

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in., & over, Birm.	$46.00-47.00
4-in., Birmingham	49.00-50.00
4-in., Chicago	57.80-58.80
6 to 24-in., Chicago	54.80-55.80
6-in. & over, east fdy.	50.00
Do., 4-in.	53.00

Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Billets and Blooms

Rerolling Quality

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., Buffalo, Young., Birm.	$37.00
Philadelphia	42.83
Duluth	39.00

Forging Quality Billets

6 x 6 to 9 x 9-in., base

Pitts., Chicago, Buffalo	43.00
Forging, Duluth	45.00

Sheet Bars

Pitts., Cleveland, Young., Sparrows Point	37.00

Slabs

Pitts., Chicago, Cleveland, Youngstown	37.00

Wire Rods

Pitts., Cleveland, No. 5 to ⅜-inch incl.	47.00
Do., over ⅜ to 41/64-in. incl.	52.00

Chicago up $1; Worcester up $2.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	2.10c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$4.00- 4.50
Connellsville, fdry.	5.00- 5.50
Connell. prem. fdry.	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.50- 5.75
Wise county fur.	4.50- 4.75

By-Product Foundry

Newark, N. J., del.	10.88-11.35
Chi., ov., outside del.	10.25
Chicago, del	11.00
Milwaukee, ovens	11.00
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.50
Indianapolis, del.	10.5c
Cincinnati, del.	10.50
Cleveland, del.	11.05
Buffalo, del.	10.50
Detroit, del.	11.10
Philadelphia, del.	10.65

Coke By-Products

Spot, gal. Producers' Plants

Pure and 90% benzol	16.00c
Toluol	22.00c
Solvent naphtha	26.00c
Industrial xylol	26.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
Do. (450 lbs.)	15.25c

Eastern Plants, per lb.

Naphthalene flakes, balls, bbls. to jobbers	6.75c

Per ton, bulk, f.o.b. oven or port	
Sulphate of ammonia	$29.50

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$25.00	$25.50	$24.50	$26.00
Birdsboro, Pa.	25.00	25.50	24.50	26.00
Birmingham, Ala.‡	20.38	.....	19.38	25.00
Buffalo	24.00	24.50	23.00	25.00
Chicago	24.00	24.00	23.50	24.50
Cleveland	24.00	24.00	23.50	24.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50	.....	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.75	26.25	25.25	26.75
Granite City, Ill.	24.00	24.00	23.50	24.50
Hamilton, O.	24.00	24.00	23.50	.....
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	22.00	.....	.....	.....
Sharpsville, Pa.	24.00	24.00	23.50	24.50
Sparrow's Point, Md.	25.00	.....	24.50	.....
Swedeland, Pa.	25.00	25.50	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00	24.00	23.50	24.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	25.39	25.39	24.89	25.89
Baltimore from Birmingham	25.78	.....	24.66	.....
Boston from Birmingham	25.87	.....	.....	.....
Boston from Everett, Mass.	26.25	26.75	25.75	27.25
Boston from Buffalo	26.25	26.75	25.75	27.25
Brooklyn, N. Y., from Bethlehem	27.50	28.00	.....	.....
Canton, O., from Cleveland	25.39	25.39	24.89	25.89
Chicago from Birmingham	†24.22	.....	.....	.....
Cincinnati from Hamilton, O.	24.44	25.11	24.78	.....
Cincinnati from Birmingham	24.06	.....	23.06	.....
Cleveland from Birmingham	24.32	.....	23.82	.....
Mansfield, O., from Toledo, O.	25.94	25.94	25.44	25.44
Milwaukee from Chicago	25.10	25.10	24.60	25.10
Muskegon, Mich., from Chicago, Toledo or Detroit	27.19	27.19	26.69	27.69
Newark, N. J., from Birmingham	26.15	.....	.....	.....
Newark, N. J., from Bethlehem	26.53	27.03	.....	.....
Philadelphia from Birmingham	25.46	.....	24.96	.....
Philadelphia from Swedeland, Pa.	25.84	26.34	25.34	.....
Pittsburgh district from Neville Island	Neville base, plus 69c, 84c, and $1.24 freight.			
Saginaw, Mich., from Detroit	26.45	26.45	25.95	25.95

	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis, northern	24.55	24.55	24.05	.....
St. Louis from Birmingham	†24.12	.....	23.82	.....
St. Paul from Duluth	26.08	26.08	.....	26.58

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $28.50, Phil. base, standard and copper bearing, $29.63.

Gray Forge		Charcoal	
Valley furnace	$23.50	Lake Superior fur.	$27.00
Pitts. dist. fur.	23.50	do., del. Chicago	30.34
		Lyles, Tenn.	26.50

Silvery†

Jackson county, O., base: 6-6.50 per cent $28.50; 6.51-7—$29.00; 7-7.50—$29.50; 7.51-8—$30.00; 8-8.50—$30.50; 8.51-9—$31.00; 9-9.50—$31.50; Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$60.80

First Quality

Pa., Ill., Md., Mo., Ky.	47.50
Alabama, Georgia	47.50
New Jersey	52.50

Second Quality

Pa., Ill., Ky., Md., Mo.	42.75
Georgia, Alabama	34.20
New Jersey	49.00

Ohio

First quality	39.90
Intermediate	36.10
Second quality	31.35

Malleable Bung Brick

All bases	$56.05

Silica Brick

Pennsylvania	$47.50
Joliet, E. Chicago	56.05
Birmingham, Ala.	47.50

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$28.00
Wire cut	$26.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Do, domestic	40.00
Do., f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00
Quickset magnesite grains, f.o.b. Chewelah, Wash., net ton, bulk	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$47.00
Chem. bonded chrome	47.00
Magnesite brick	67.00
Chem. bonded magnesite	57.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$23.50-24.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail $20, barge	$22.00
No. 2 lump	22.00-23.00

Ferroalloy Prices

Ferromanganese, 78-82%, tidewater, duty pd. $102.50
Do., del. Pittsburgh 107.77

Spiegeleisen, 19-21% dom. Palmerton, Pa., spot 33.00
Do., New Orleans 33.00
Do., 26-28%, Palmerton 39.00

Ferrosilicon, 50% freight allowed, c.l. 69.50
Do., ton lot 80.50
Do., 75 per cent 126.00
Spot, $5 a ton higher.

Silicoman., 2½ carbon 106.50
2% carbon 111.50 1% 121.50
Contract ton price $11 higher; spot $5 over contract.

Ferrotungsten, stand., lb. con. del. cars 1.70-1.75

Ferrovanadium, 35 to 40%, lb., cont. 2.70-2.80

Ferrotitanium, c. l., prod. plant, frt. all., net ton 142.50
Contract, ton lots 145.00
Spot, ton lots 150.00

Ferrophosphorus, per ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage, 58.50; electrolytic, per ton, c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage 75.00

Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del. carlots 10.50
Do., ton lots 11.25c
Do., less-ton lots 11.50c

67-72% carloads, 2% carbon, per lb. contained chrome 16.50c
Do., ton lots 17.25c
Do., less-ton lots 17.50c

	Carloads	Ton lots	Less ton
2% carb.	16.50c	17.25c	17.50c
1% carb.	17.50c	18.25c	18.50c
0.10% carb.	18.50c	19.25c	19.50c
0.20% carb.	19.50c	20.25c	20.50c

Spot ¼c higher

Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. 0.95

Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80

Ferrotitanium, 40%, lb. con. ti., ton lots 1.23
Do, less-ton lots 1.25
20-25% carbon, 0.10 max., ton lots, lb. 1.35
Do, less-ton lots 1.40
Spot 5c higher

Ferrocolumbium, 50-55%, contract, lb. con. col., f.o.b. Niagara Falls 2.25
Do, less-ton lots 2.30
Spot is 10c higher

Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill 0.80

Ferro-carbon-titanium, 15-18%, ti., 6-8% carb., carlots, contr., net ton 142.50
Do, spot 145.00
Do, contract, ton lots 145.00
Do, spot, ton lots 150.00

15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50
Do, spot 160.00
Do, contract, ton lots 160.00
Do, spot, ton lots 165.00

Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c
Spot ½c lb. higher

Chromium Briquets, contract carloads, f.o.b. Niagara Falls, lb. 7.25c
Do, spot carlots, bulk 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c

Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb. 2.80
Do, smaller lots 3.00-3.10

Vanadium Pentoxide, contract, lb. contained 1.10
Do, spot 1.15

Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome 80.00c
Do, spot 85.00c
88% chrome, contract 79.00c
Do, spot 84.00c

Silicon Metal, 1% iron, contract, lb. 14.50c
Do, 2% 13.00c
Spot ¼c higher

Silicon Briquets, contract, carloads, f.o.b. Niagara Falls, ton 74.00
Do, spot 79.00
Less-ton lots, lb. 4.25c

Manganese Briquets, contract carloads, f.o.b. Niagara Falls, lb. 5.00c
Ton lots 5.50c
Less-ton lots 5.75c
Spot ¼c higher

Zirconium Alloy, 12-15%, carloads, gross ton 97.50
Do, spot 102.50
34-40%, contract, carloads, lb., alloy 14.00c
Do, ton lots 15.00c
Do, less-ton lots 16.00c
Spot ¼c higher

Molybdenum Powder, 99%, f.o.b. York, Pa., 200-lb. kegs, lb. 2.60
Do, 100-200 lb. lots 2.75
Do, under 100-lb. lots 3.00

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-In. & Over	Structural Shapes	Floor Plates	Sheets Hot Rolled No. 10	Sheets Hot Roll Ann. No. 24	Sheets Galv. No. 24
Boston	4.26	4.46	5.46	4.11	4.10	5.76	4.21	4.96	5.00
New York (Metropolitan)	4.16	4.36	4.36	4.02	3.99	5.62	4.11	4.50	4.75
Philadelphia	4.03	4.13	4.63	3.92	3.92	5.25	4.03	4.65	4.90
Baltimore	4.00	4.20	4.45	3.90	3.90	5.50	3.95	4.50	4.70
Norfolk, Va.	4.20	4.40	4.65	4.10	4.10	5.70	4.15	4.75	5.40
Buffalo	3.90	4.25	4.25	3.95	3.80	5.55	4.00	4.83	5.38
Pittsburgh	3.80	4.00	4.00	3.70	3.70	5.30	3.75	4.50	5.15
Cleveland	3.75	4.19	4.19	3.89	3.89	5.49	3.94	4.69	5.34
Detroit	3.94	4.19	4.19	3.98	3.98	5.58	3.94	4.69	5.43
Cincinnati	4.08	4.28	4.28	3.98	3.98	5.58	4.03	4.78	5.43
Chicago	3.85	4.10	4.10	3.75	3.75	5.35	3.85	4.60	5.25
Minneapolis	4.10	4.35	4.35	4.00	4.00	5.60	4.10	4.75	5.00
Milwaukee	3.96	4.21	4.21	3.86	3.86	5.46	3.96	4.71	5.36
St. Louis	4.12	4.37	4.37	4.02	4.02	5.62	4.12	4.87	5.52
Kansas City	4.40	4.65	4.65	4.30	4.30	5.90	4.10	4.85	5.50
Memphis	4.35	4.55	4.55	4.25	4.25	5.91	4.30	5.05	5.70
Chattanooga	4.25	4.45	4.45	4.15	4.15	5.98	4.20	4.10	4.70
Tulsa, Okla.	4.89	5.14	5.14	4.79	4.79	6.39	4.89	5.64	6.29
Birmingham, Ala.	3.85	4.05	4.05	3.75	3.75	6.03	3.80	4.55	5.20
New Orleans	4.10	4.65	4.65	4.00	4.00	5.95	4.25	4.75	5.15
Houston, Tex.	3.75	6.15	6.55	4.25	4.25	6.15	4.50	5.25	5.65
Seattle	4.45	4.95	6.30	4.25	4.25	6.00	4.50	5.35	5.90
Portland, Oreg.	4.45	4.95	6.30	4.25	4.25	6.00	4.50	5.15	5.90
Los Angeles	4.30	4.80	6.55	4.30	4.30	6.20	4.50	5.00	5.25
San Francisco	4.20	4.80	6.50	4.05	4.05	5.55	4.30	5.15	5.55

	Cold Rolled Strip	Cold Finished Bars	SAE Hot-rolled Bars (Unannealed) 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series	SAE Cold Drawn Bars 2300	SAE Cold Drawn Bars 3100
Boston	3.86	4.71	4.56	8.00	6.55	6.30	8.40	9.02	7.57
New York	3.81	4.61	4.36	7.84	6.39	6.14	9.54	9.04	7.59
Philadelphia	3.91	4.56	4.28	7.81	6.36	6.11	9.01	....	....
Baltimore	....	4.55	4.15	....	....	....	....	....	....
Norfolk, Va.	....	4.60	....	....	....	....	....	....	....
Buffalo	3.82	4.35	4.10	7.60	6.15	5.90	8.00	8.60	8.15
Pittsburgh	....	4.15	3.95	7.70	6.25	8.50	9.10	8.70	7.25
Cleveland	3.60	4.30	3.95	7.78	6.33	6.33	8.18	8.60	7.15
Detroit	3.80	4.30	4.09	7.92	6.47	6.22	7.74	8.90	7.45
Cincinnati	....	4.53	4.10	7.94	6.49	6.24	9.34	8.95	7.50
Chicago	3.91	4.30	4.05	7.60	6.15	5.90	8.00	8.60	7.15
Minneapolis	....	4.83	4.25	7.95	6.50	9.03	9.63	9.23	7.78
Milwaukee	..	4.41	4.16	7.81	6.36	6.11	8.21	8.81	7.36
St. Louis	4.01	4.57	4.32	7.97	6.52	6.27	8.37	8.97	7.52
Kansas City	4.46	4.85	....	....	....	....	....	....	....
Memphis	....	4.86	....	....	....	....	....	....	....
Chattanooga	....	4.90	....	....	....	....	....	....	....
Tulsa, Okla.	....	5.34	....	....	....	....	....	....	....
New Orleans	5.00	5.10	....	....	....	....	....	....	....
Seattle	....	5.85	6.05	....	8.00	8.00	8.65	....	....
Portland, Oreg.	....	5.85	5.85	9.00	8.00	7.85	8.70	....	....
Los Angeles	5.96	6.85	4.65	9.40	8.55	8.40	9.05	10.40	9.55
San Francisco	9.30	6.80	5.20	9.65	8.80	8.65	9.30	10.65	9.80

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, June 2

Export Prices f. o. b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, gross tons: Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Si.	$27.22 5 10 0	$15.36	1 18 0
Basic bessemer	.....	17.99	2 4 6
Hematite, Phos. .03-.05	32.18 6 10 0	.....	.....
Billets	$38.98 7 17 6	$43.46	5 7 6
Wire rods, No. 5 gage	55.81 11 5 6	41.43	5 2 6
Standard rails	$50.12 10 2 6	$44.28	5 15 0
Merchant bars	2.44c 11 0 0	1.93c	5 5 0
Structural shapes	2.36c 10 12 6	1.78c	4 17 6
Plates, †¼ in. or 5 mm.	2.94c 13 5 0	2.24c	6 2 6
Sheets, black, 24 gage or 0.5 mm.	3.11c 14 0 0	2.66c	7 5 0
Sheets, gal., 24 ga., corr.	3.72c 16 15 0	3.29c	9 0 0°
Bands and strips	2.94c 13 5 0	2.01c	5 10 0
Plain wire, base	4.33c 19 10 0	2.24c to 2.66c	6 2 6 to 7 5 0
Galvanized wire, base	5.17c 23 5 0	2.87c to 2.97c	7 17 6 to 8 2 6
Wire nails, base	4.11c 18 10 0	2.56c to 2.74c	7 0 0 to 7 10 0
Tin plate, box 108 lbs.	$ 5.01 1 0 3	.....	.....

British ferromanganese $102.50 delivered Atlantic seaboard, duty-paid

Domestic Prices at Works or Furnace—

Last Reported

	£ s d	French Francs		Belgian Francs		Reich Mark
Fdy. pig iron, Si. 2.5	$26.98 5 9 0(a)	$16.56	598	$16.90	500	$25.30	63
Basic bess. pig iron	24.75 5 0 0(a)	.....	...	.....	...	27.91 (b)	69.50
Furnace coke	8.04 1 12 6	5.68	205	7.27	215	7.63	19
Billets	38.98 7 17 6	23.27	840	29.07	860	38.75	96.50
Standard rails	2.25c 10 2 6	1.50c	1,150	2.06c	1,375	2.38c	132
Merchant bars	2.71c 12 4 0††	1.40c	1,080	1.65c	1,100	1.98c	110
Structural shapes	2.45c 11 0 6††	1.37c	1,055	1.65c	1,100	1.93c	107
Plates, †¼-in. or 5 mm.	2.60c 11 14 3††	1.76c	1,350	2.06c	1,375	2.29c	127
Sheets, black	3.50c 15 15 0§	2.03c	1,565‡	2.36c	1,575‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	4.11c 18 10 0	2.93c	2,250	4.43c	2,950	6.66c	370
Plain wire	4.33c 19 10 0	2.16c	1,660	2.48c	1,650	3.11c	173
Bands and strips	2.87c 12 19 0††	1.57c	1,210	1.95c	1,300	2.29c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed ††Rebate of 15s on certain conditions.

**Gold pound sterling carries a premium of 65.59 per cent over paper sterling.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1	10.00
Bos. dock No. 1 exp.	9.00- 9.50
N. Eng. del. No. 1	10.00
Buffalo, No. 1	10.50-11.00
Chicago, No. 1	10.00-10.50
Chicago, auto, no alloy	8.75- 9.25
Chicago, No. 2 auto	7.50- 8.00
Cincinnati	7.75- 8.25
Cleveland, No. 1	10.00-10.50
Cleveland, No. 2	9.00- 9.50
Detroit, No. 1	6.50- 7.00
Eastern Pa., No. 1	11.50-12.00
Eastern Pa., No. 2	9.50-10.00
Federal, Ill.	9.75-10.25
Granite City, R. R.	9.75-10.00
Granite City, No. 2	9.25- 9.75
Los Angeles, No. 1	11.50-12.00
Los Angeles, No. 2	10.00-10.50
New York, No. 1	†9.00
N. Y. dock No. 1 exp.	8.50
Pitts., No. 1 (R. R.)	12.25-12.75
Pitts., No. 1 (dlr.)	10.50-11.00
Pittsburgh, No. 2	9.50-10.00
St. Louis, R. R.	10.25-10.75
St. Louis, No. 2	9.25- 9.75
San Francisco, No. 1	12.00
Seattle, No. 1	10.00-12.00
Toronto, dirs. No. 1	9.00
Valleys, No. 1	11.00-11.50

COMPRESSED SHEETS

Buffalo	8.50- 9.00
Chicago, factory	9.00- 9.50
Chicago, dealer	8.00- 8.50
Cleveland	9.50-10.00
Detroit	7.00- 7.50
E. Pa., new mat.	11.50-12.00
E. Pa., old mat.	8.00- 8.50
Los Angeles	12.50-13.00
Pittsburgh	10.50-11.00
St. Louis	5.50- 6.00
Valleys	10.00-10.50
Cincinnati, del	7.25- 7.75

BUNDLED SHEETS

Buffalo, new	8.50- 9.00
Buffalo, old	7.50- 8.00
Cleveland	7.50- 8.00
Los Angeles	11.00-11.50
Pittsburgh	9.50-10.00
St. Louis	4.50- 5.00
Toronto, dealers	6.00

SHEET CLIPPINGS, LOOSE

Chicago	5.25- 5.75
Cincinnati	3.25- 3.75
Detroit	4.75- 5.25
†Los Angeles	3.75- 4.00
St. Louis	3.50- 4.00

STEEL RAILS, SHORT

Birmingham	15.00
Buffalo	15.50-16.00
Chicago (3 ft.)	13.00-13.50
Chicago (2 ft.)	13.50-14.00
Cincinnati, del.	15.00-15.75
Detroit	13.50-14.00
Los Angeles	15.00-17.50
Pitts., 3 ft. and less	14.50-15.00
St. Louis, 2 ft. & less	13.00-13.50

STEEL RAILS, SCRAP

Boston district	†9.00
Buffalo	12.50-13.00
Chicago	10.75-11.25
Cleveland	14.00-14.50
Pittsburgh	14.00-14.50
St. Louis	11.25-11.75
Seattle	16.00

STOVE PLATE

Birmingham	8.00- 8.50
Boston district	†7.00
Buffalo	10.50-11.00
Chicago, net	7.50- 8.00
Cincinnati, dealers	4.75- 5.25
Detroit, net	7.50- 8.00
Eastern Pa.	10.50-11.00
New York, fdry.	†6.50- 7.00
St. Louis	6.75- 7.25
Toronto, dealers, net	8.00

SPRINGS

Buffalo	14.00-14.50
Chicago, coil	14.50-15.00
Chicago, leaf	14.00-14.50
Eastern Pa.	15.50-16.00
Pittsburgh	14.00-14.50
St. Louis	12.75-13.25

ANGLE BARS—STEEL

Chicago	12.00-12.50
St. Louis	11.00-11.50

RAILROAD SPECIALTIES

Chicago	13.00-13.50

LOW PHOSPHORUS

Buffalo, crops	14.50-15.00
Cleveland, crops	17.50-18.50
Eastern Pa., crops	16.00-16.50
Pittsburgh, crops	15.50-16.00

FROGS, SWITCHES

Chicago	10.50-11.00
St. Louis, cut	11.25-11.75

SHOVELING STEEL

Federal, Ill.	10.00-10.50
Granite City, Ill.	9.25- 9.75
Los Angeles	15.00-16.50
Toronto, dealers	7.00

RAILROAD WROUGHT

Birmingham	11.00-11.50
Boston district	†9.00- 9.50
Chicago, No. 1 net	8.00- 8.50
Cincinnati, No. 2	7.75- 8.25
Eastern Pa., No. 1	13.50-14.00
St. Louis, No. 1	8.00- 8.50
St. Louis, No. 2	10.00-10.50
Toronto, No. 1 dlr.	15.00

SPECIFICATION PIPE

Eastern Pa.	12.00-12.50
New York	†6.50- 7.00

BUSHELING

Buffalo, No. 1	8.50- 9.00
Chicago, No. 1	8.75- 9.00
Cincin., No. 1, deal.	6.25- 6.75
Cincinnati, No. 2	2.00- 2.50
Cleveland, No. 2	5.00- 5.50
Detroit, No. 1, new	6.25- 6.75
Valleys, new, No. 1	10.00-10.50
Toronto, dealers	6.00

MACHINE TURNINGS (Long)

Birmingham	6.00- 7.00
Buffalo	4.50- 5.00
Chicago	4.50- 5.00
Cincinnati, dealers	2.25- 2.75
Cleveland	5.00- 5.50
Detroit	3.25- 3.75
Eastern Pa.	6.00- 6.50
Los Angeles	4.00- 4.25
New York	†2.50- 3.00
Pittsburgh	6.00- 6.50
St. Louis	2.00- 2.50
Toronto, dealers	6.00
Valleys	7.00- 7.50

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	1.25
Buffalo	4.50- 5.00
Cincinnati, dealers	1.75- 2.25
Cleveland	5.00- 5.50
Eastern Pa.	6.00- 6.50
Detroit	3.75- 4.25
New York	†2.00- 2.50
Pittsburgh	5.50- 6.00
Toronto, dealers	6.50

CAST IRON BORINGS

Birmingham	6.00- 7.00
Boston dist. chem.	†5.00
Bos. dist. for mills	†6.00
Buffalo	4.00- 4.50
Chicago	4.75- 5.25
Cincinnati, dealers	1.75- 2.25
Cleveland	5.00- 5.50
Detroit	3.75- 4.25
E. Pa., chemical	10.00-11.00
New York	†3.00- 3.50
St. Louis	2.00- 2.50
Toronto, dealers	6.50

PIPE AND FLUES

Cincinnati, dealers	4.75- 5.25
Chicago, net	7.50- 8.00

RAILROAD GRATE BARS

Buffalo	8.00- 8.50
Chicago, net	7.25- 7.75
Cincinnati	5.25- 5.75
Eastern Pa.	10.00-10.50
New York	†6.50- 7.00
St. Louis	7.00- 7.50

FORGE FLASHINGS

Boston district	†4.00
Buffalo	8.50- 9.00
Cleveland	10.00-10.50
Detroit	5.75- 6.25
Los Angeles	9.00
Pittsburgh	9.50-10.00

FORGE SCRAP

Boston district	†4.00
Chicago, heavy	14.00-14.50

ARCH BARS, TRANSOMS

St. Louis	12.00-12.50

AXLE TURNINGS

Boston district	†7.50
Buffalo	9.00- 9.50
Chicago, elec. fur.	9.50-10.00
Eastern Pa.	9.50 10.00
St. Louis	8.00- 8.50
Toronto	7.00

STEEL CAR AXLES

Birmingham	16.00-17.00
Buffalo	15.50-16.00
Boston district	†14.00
Chicago, net	15.50-16.00
Eastern Pa.	21.50-22.50
St. Louis	17.00-17.50

SHAFTING

Boston district	†13.00-13.25
New York	†14.00-14.50
Eastern Pa.	18.00-18.50
St. Louis	13.00-13.50

CAR WHEELS

Birmingham	14.00-15.00
Boston dist., iron	†8.25
Buffalo, steel	14.00-14.50
Chicago, iron	11.50-12.00
Chicago, rolled steel	13.00-13.50
Cincinnati, iron	12.00-12.50
Eastern Pa., iron	14.50-15.00
Eastern Pa., steel	15.50-16.00
Pittsburgh, iron	13.00-13.50
Pittsburgh, steel	15.00-15.50
St. Louis, iron	11.25-11.75
St. Louis, steel	12.75-13.25

NO. 1 CAST SCRAP

Birmingham	14.00-14.50
Boston, No. 1 mach.	†10.00
N. Eng. del. No. 2	8.50
N. Eng. del. textile	11.50-12.00
Buffalo, cupola	12.50-13.00
Buffalo, mach.	13.00-13.50
Chicago, agri. net	9.50-10.00
Chicago, auto	10.00-10.50
Chicago, railr'd net	10.00-10.50
Chicago, mach. net	10.50-11.00
Cincin., mach. cup.	9.75-10.25
Cleveland, mach. net	14.00-14.50
Eastern Pa., cupola	14.50-15.00
E. Pa., mixed yard	11.50-12.00
Los Angeles, net	13.50-14.00
Pittsburgh, cupola	12.50-13.00
San Francisco, del.	13.50-14.00
Seattle	10.00-12.00
St. Louis, No. 1	10.50-11.00
St. L., No. 1, mach.	12.25-12.75
Toronto, No. 1, mach., net	11.50

HEAVY CAST

Boston dist. break.	†7.00- 7.25
New England, del.	10.50-11.00
Buffalo, break.	10.00-10.50
Cleveland, break. net	13.00-14.00
Detroit, break.	10.00-10.50
Detroit, auto net	11.00-11.50
Eastern Pa.	12.50-13.00
Los Ang., auto, net	13.00-13.50
New York, break.	†8.00- 8.50
Pittsburgh, break.	10.50-11.00

MALLEABLE

Birmingham, R. R.	12.50-13.50
New England, del.	13.00
Buffalo	12.00-12.50
Chicago, R. R.	11.25-11.75
Cincin., agri. del.	9.00- 9.50
Cleveland, rail	13.50-14.00
Detroit, auto	10.00-10.50
Eastern Pa., R. R.	14.00-14.50
Los Angeles	17.50-18.00
Pittsburgh, rail	13.00-13.50
St. Louis, R. R.	10.50-11.00

RAILS FOR ROLLING

5 feet and over

Birmingham	16.00-17.00
Boston	†9.50
Chicago	14.50-15.00
Eastern Pa.	16.00-16.50
New York	†14.00-14.50
St. Louis	13.25-13.75

LOCOMOTIVE TIRES

Chicago (cut)	13.50-14.00
St. Louis, No. 1	12.00-12.50

LOW PHOS. PUNCHINGS

Buffalo	14.50-15.00
Chicago	13.50-14.00
Eastern Pa.	16.00-16.50
Pitts. (light & hvy.)	13.50-14.00
Seattle	15.00

Iron Ore

Lake Superior Ore

Gross ton, 51½ % Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbess.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbess.	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-10.00
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, f.a.s. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	12.00-13.00
No. Afr. low phos.	nominal
Swedish low phos.	17.00-18.00
Spanish No. Africa basic, 50 to 60% nom.	12.00
Tungsten, sh. ton. unit, duty pd. nom.	$15.75
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$25.50-26.50
Molybdenum ores sulphide, per lb. molybdenum contained, f.o.b. mill	0.75

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52%	non. 45.00
So. African, 50-52%	nom. 45.00
Indian, 50-52%	Nominal

Sheets

Sheet Prices, Page 78

Pittsburgh — Sheet production in common black and full finished remains unchanged, with galvanized sheet production reported up 1 point to 39 per cent of capacity. There is little possibility that any buying will develop in the near future and an extremely dull summer is in view. Tonnages for May finished up as was expected, slightly under the April totals.

Cleveland — Third quarter price announcement is expected soon on galvanized sheets. Some sellers anticipate no change in base prices but look for a revision in functional allowances. Total tonnage booked so far this month is slightly below the comparable period of May.

Chicago — Sheet sales for May were off about 20 per cent from the April volume and the present light demand indicates a decline, May figures being about as much as producers can expect. When prices on galvanized sheets are determined, it is expected the new price cards will be issued, possibly within the next week.

Boston—Sheet buying is in small lots, few tonnage releases appearing. This applies to all finishes. Aggregate volume is barely maintained at the recent low rate. Consumption by most industrial consumers continues light. Tack-makers are still heavily stocked in most instances.

New York — Sheet tonnage is shrinking here, with most sellers reporting a drop in volume in May and the current month starting off inauspiciously. Dual schedules now in effect on hot and cold sheets provide some consumers with an advantage of $1 until the end of this month when the old schedules expire. However, this advantage is believed to be too small to stimulate much special interest. Galvanized sheets moved particularly slowly last week, pending clarifying action by the mills.

Philadelphia — Automotive specifications show no increase. Automotive replacement part business is fairly satisfactory. According to trade reports, Philco Radio will not reopen its plant, recently closed by strike, but will move its manufacturing facilities to Detroit, where its engineering department now is located. Philco is said to be the largest user of hot-rolled strip in the radio industry. Stainless sheets are moving fairly well with the chemical industries the most active takers for storage tanks, etc.

Cincinnati—Demand for sheets before the holiday was heavy in comparison to recent specifications, but orders last week were slow to revive. Galvanized tends to be more active but other demand is in former patterns. The undertone of the market is improved as a result of third quarter price schedules and some booking is being done for future needs, but not in volume sufficient to indicate the general outlook.

St. Louis—The sheet situation continues quiet, with new buying and specifications the smallest this year. Ordering is on an immediate requirement basis, and announcement of third quarter prices has aroused no interest. Stove manufacturers account for a fair volume of sheets, including enameling stock and light material for stovepipe. Consumption by the farm implement industry has declined more than seasonally.

Birmingham, Ala. — Production of sheets is light with demand barely steady. Manufacturers' sheets continue to supply most of the demand locally.

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Strip

Strip Prices, Page 79

Pittsburgh — Production of strip has decreased slightly this week, but the average of both hot and cold-rolled is around 20 per cent of capacity. Hot-rolled production has dropped slightly, with cold-rolled unchanged. Totals for May indicate a slight drop from April and demand is practically absent. June will probably be the low point for the year thus far, according to the trend of orders now being received.

Cleveland—Commodity cold-rolled strip prices have been announced, effective immediately and for third quarter. The 14 and 20 gage bases have been eliminated and a new base price of $3.25, Pittsburgh and Cleveland, with a new list of quantity extras and deductions applying has been put into effect. The net result of the adjustments is in an average $2 a ton reduction. Requirements from stove, refrigerator, radio and other household equipment manufacturers have shown little change.

Chicago — Demand for strip is tapering slightly and further decreases are expected. No effect has been felt from price changes and nothing is seen to warrant expectations of an early upturn.

Boston — The combination of low consumer operations and slow liquidation of finished parts and goods continues to stymie movement of narrow cold strip. Small orders for prompt delivery from miscellaneous users account for most of current volume, with the result mill operations are irregular at around 30 per cent. The automobile, textile equipment, electrical goods and other larger consuming industries are slow buyers. Reflecting the situation in cold strip rerollers are buying hot strip in fill-in lots only.

New York — Cold-rolled strip buying continues on a hand-to-mouth basis. Mills have practically no backlog and operations fluctuate with incoming volume from day to day, prompt delivery being specified with all orders. Smaller miscellaneous consumers are buying relatively better than the larger users. With wider gaps appearing in consumer inventories, current consumption is closer in line with production. Lack of demand for finished goods made of strip, however, curtails buying. Hot strip buying is confined to scattered fill-in shipments.

Philadelphia — A sidelight on strip inventories is revealed by the fact one leading user has only 3 per cent as much on hand as a year ago. This probably is not entirely typical but indicates present buying policies. Job stampers are figuring on considerable work which is apparently being held back pending the appearance of better business generally.

Birmingham, Ala. — Output of strip, dependent on hand to mouth buying, is especially slow. Narrow strip, particularly cotton ties, will not be in demand until the cotton season gets under way.

Plates

Plate Prices, Page 78

Philadelphia—One platemaker is operating at better than 30 per cent of capacity on release of business on its books for some time. A moderate amount of export business also is bolstering order books for several producers. Japan and South Africa both have been in the market recently. New domestic business is spotty Requirements of tank makers are light and railroads show no interest. A local locomotive builder will have present orders cleaned up in 60 to 90 days. A nearby tube works is operating three full days weekly.

Cleveland—Sellers report a slight improvement in inquiries and orders. Some attribute this to reaffirmation of third quarter prices. Mill operations in some instances reflect this mild improvement, although specifications from most consumers are limited to actual requirements.

Chicago—Sales the last week of May made the month's volume comparatively good. Oil requirements represent a high percentage of the business and are the lone bright spot in demand. Requirements of municipal projects have tapered and are now almost dormant, although release of further government funds is expected to step up this demand again at a later date. Inquiries still consist of minor tonnages.

Boston—For oil tanks at East Boston and Bangor, Me., 630 tons of plates have been placed. Shipbuilding continues to loom, six New England yards estimating seven 110-foot steel hull harbor cutters, closing June 15 with the coast guard and 16 smaller yards have plans for sixty 38-foot picket boats, closing June 20 for delivery in lots of 5 to 10, Atlantic coast. The cutters require 750 tons of steel.

Atlantic Refining Co. is increasing storage facilities at New Haven, Conn., Providence, R. I., and Newark, N. J. A steel tank of 750,000 gallons capacity will be built at New Haven, one of 725,000 gallons at Providence and two of 1,120,000 gallons at Newark. Chicago Bridge & Iron Co. has been given contracts for the tanks. Docking facilities at Newark will also be enlarged.

New York — Apart from some relatively small navy tonnage, plate buying for ships is disappointingly light, according to sellers. No action has yet been taken on the four cargo boats for the American Export Lines Inc., this city, on which Bethlehem Shipbuilding Corp., Bethlehem, Pa., and Sun Shipbuilding & Dry Dock Corp., Chester, Pa., each appear to have a chance, and no award has yet been made of the 30 scows for this city.

Steel for the Southern railway list still pends action by the interstate commerce commission, with little else in sight in the railroad field.

Birmingham, Ala. — Miscellaneous demand for plates continues comparatively good and is responsible, in a large measure, for the recent increase in ingot production. Some new business is expected to come from the government for cargo vessels. Some 3500 tons in plates and shapes is anticipated for each of the four vessels.

Plate Contracts Placed

1050 tons, 44 cone roof tanks, Standard Oil Co., Detroit, to Chicago Bridge & Iron Co., Chicago.

875 tons, 36-inch steel water pipe, Washington, to American Locomotive Works, Dunkirk, N. Y.

420 tons, three oil tanks, State Fuel Co., East Boston, Mass., to Chicago Bridge & Iron Co., Chicago.

400 tons, two tanks, Newark, N. J., for Atlantic Refining Co., to Chicago Bridge & Iron Co. Chicago.

210 tons, three tanks, Bancroft & Martin Rolling Mills, Bangor, Me., sub-let to Chicago Bridge & Iron Co., Chicago.

150 tons, water storage tank, Pasco, Wash., to unstated interest.

140 tons, 1,000,000-gallon elevated steel water tank (including 450 tons of shapes), town of Lake, Milwaukee county, Wis., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

Unstated tonnage, tank and tower, veterans' hospital, Murfreesboro, Tenn., to Taylor Iron Works & Supply Co., Macon, Ga., $10,237; bids May 17.

Plate Contracts Pending

500 tons, high tensile plates, navy department, bureau of supplies and accounts; delivery Brooklyn and Philadelphia, schedule 3486, lot 129 bids May 20 Alan Wood Steel Co., Conshohocken, Pa., low.

Unstated tonnage, one 115-foot steam derrick lighter; bids June 30, to U. S. engineer, New York.

Unstated tonnage, three fleet tugs, navy department, bids June 22; first inquiry calling for one tug amended for three bids close same day on four destroyers and three submarines.

Unstated tonnage, elevated water storage tank, Two Rivers, Wis.; city will apply for PWA grant for $35,000 water system improvements.

Unstated, storage tank and tower, Lowell, Wash.; bids June 9.

Unstated, conduit linings and fittings, Coulee dam; M. L. Foss Co., Denver, general contractor.

Bars

Bar Prices, Page 78

Pittsburgh — Demand for steel bars is at the lowest point thus far this year with orders coming in slowly and obviously for fill-in purposes. Total production for May was about the same as that of April, although the outlook for the summer is that tonnages will probably decrease.

Cleveland — Demand for carbon steel bars remains at the low levels of May. Announcement of third quarter prices has failed to bring in much additional tonnage. Requirements from road and farm equipment manufacturers continue in fair volume. Mill operations are substantially unchanged.

Chicago — Bar sales are slower this week and it is apparent reaffirmation of prices did nothing to stimulate buying. Prospects of an early increase in demand are not seen and present movement continues to consist almost entirely of small tonnages.

Boston—Commercial steel, alloy and forging bar demand is more spotty with volume off slightly from the recent slack rate. Larger consumers are buying only for fill-in and most sellers expect a continuance of this character of business until late summer. Government shops at Springfield and Watertown, Mass., have increased inquiry for alloy bars. Shops connected with the airplane industry are making the best showing. The mild improvement in tool steel, recently noted by a few sellers, has subsided.

New York — Bar buying is at perhaps the lowest point this year. With automotive demand, normally the principal outlet, negligible, and with little coming out from railroads, volume has been well under normal for many weeks. Adding to this situation recently has been further decline in miscellaneous demand.

Philadelphia — Bar sellers are somewhat encouraged over a slight increase in total May volume, compared with April, the average gain being around 5 to 10 per cent. May business in this section is said to have been somewhat better than in other areas. Cold-drawn bars are slow with inventory of a district producer substantial. Prices are firm.

Birmingham, Ala. — Bars are in rather slow demand. There has been some appreciable business in reinforcing bars. Anticipation still is that agricultural implement manufacturers soon will enter the market.

Tin Plate

Tin Plate Prices, Page 78

Pittsburgh — Tin plate production is slowing down somewhat as a result of the effect of business conditions on general line production. Packers' cans are holding steady instead of starting into a peak production period normally experienced at this time. Total production is estimated around 50 per cent of capacity, and it is not expected to go much below this point as demand will undoubtedly develop for packers' cans with the beginning of the heavy packing season in the summer.

New York — Tin plate buying is disappointing. Notwithstanding the fact that this should normally be the most active period of the year, specifications are coming out sluggishly. Not only have some leading can makers fair stocks of tin plate on hand, but also good stocks

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Behind the Scenes with STEEL

New Buggy

■ Mirrors of Motordom last week told about Crosley's new "Jitterbug" which threatens to become the nemesis of the highways. With a jitterbug behind a jitterbug steering wheel, lost in the swing of jitterbug music, the poor truckers just won't have a chance. Incidentally, we hope Mr. Crosley is successful with the new little jalopie, but if previous attempts are any indication we'd say "all that jitters is not gold."

The Winnah! (We Hope)

■ We have tickets and chances on so many different things right now we pass each day with bated breath. For a total outlay of not over five bucks we are definitely promised a lovely Buick sedan, a two weeks' trip to Bermuda, $1000 in cash, two year's supply of gasoline and oil at the corner station, an eight-room bungalow and a free beer at the favorite bar. Of course, what we really would like to have is that free beer—what could we possibly do with any of those other useless nicknacks?

68,000 Strong

■ A lot of people probably have no conception of the pass-along readership STEEL has. Once in a while we forget it ourselves but not for long. We've seen some of our current issues so thumb-marked and dog-eared you'd think they were the funny papers after the Dionne quins had done their Sunday reading. Matter of fact, each copy of STEEL gets read by an average of over 6 individuals. Carnegie-Illinois at Pittsburgh took a crack at the record this last week when they requested routing slips for seven of their subscriptions filled out for 75 (count 'em) readers. If there are, by chance, any of your fellow sufferers who are not getting their weekly squint at these pages let us know and we'll see that you get a supply of those easy-to-use routing slips at no cost whatsoever, which is a special rate as you can see.

Our Mistake, Not His

■ That insurance man of ours was in again today going through his routine but he seemed a bit happier than usual. Asked why, he says it is because he is celebrating his 25th wedding anniversary, his father's 80th birthday, and his daughter's 5th anniversary all this very day. We thought that was very nice, too, until he added that said daughter was just 26 years old last month and that left us sitting there with a silly expression on our face and trying to change the subject. It worked out all right, however, and he had a big laugh. Just before he left he explained all about adopting the little girl not long after they were married. Were we relieved!

"Uncle Joe"

■ Perhaps one of this column's 68,000 readers (sic) can assist T. M. Sinclair, P. A., Line Material Co., South Milwaukee. He is anxious to learn more about "Uncle Joe" Lemont, pioneer steel maker of the Birmingham district, who died last month at 88. Uncle Joe spent 67 of those 88 years in the steel industry, and sailed over from Scotland at 18 in a ship of iron which he had helped to make. He and Sam McDonald are credited with having invented the duplex steel process when with Tenn. Coal, Iron & R. R. Co. There must be a lot of interesting anecdotes on Uncle Joe, so if you know more about him will you pass it along to Mr. Sinclair?

R. R. Contest

■ Early returns show no correct guesses on the railroad which hauls the heaviest tonnage per mile. Hint No. 1: It is west of Hoboken, east of Hollywood and the engineer wears size 12 shoes.

—SHRDLU

of fabricated products. Demands are less pressing than is usually the case. Moreover, despite prospects of bumper crops, it appears that there will not be as much canning as usual. Export specifications continue light.

Birmingham, Ala.—Shipment of 3850 tons of tin plate to the Pacific coast, in the first consignment to that area from the new tin mill of the Tennessee Coal, Iron & Railroad Co., has just been started from here. The shipment was by rail to Mobile where it will be loaded aboard the Isthmian Lines steamer MOBILE CITY for transportation to the West coast.

Pipe

Pipe Prices, Page 79

Pittsburgh — Production of pipe and tubular goods is unchanged, between 35 and 40 per cent of capacity. Demand continues at same levels. No increase was seen in May over April business and little change is expected in June.

Cleveland — Cast iron pipe foundries report a slight improvement in miscellaneous requirements from private sources. Most current demand has originated from municipalities. Reflecting this condition James B. Clow & Sons Co., Cleveland, recently booked 1100 tons of 4-6-12-18 and 24-inch cast pipe for a water distribution system, Cuyahoga Falls, O. Bids go in June 6 on 8100 feet of 20-inch cast pipe for a force main at Mansfield, O. Steel pipe requirements out of jobbers' stocks remain substantially unchanged.

Chicago — Demand remains unchanged, the tendency being slightly downward. Government projects continue to constitute the bulk of requirements, but this tonnage is small and only noticeable because of quietness of other demands. City PWA projects are expected to bring about some calls shortly, the present jobs involving federal funds being WPA projects.

Boston — Cast pipe purchases have declined slightly with smaller lots involved, most municipalities having covered for the bulk of requirements for next few months. With indications federal loans and grants will be freer soon, numerous water main projects will go ahead and a contra-seasonal pick-up in pipe is likely later this year. Steel pipe demand is steady in small lots with secondary distributors and sharp competition prevails for the few attractive building tonnages. Wrought pipe moves slowly.

New York — Merchant pipe is

moving in limited quantities and at unsettled prices. Producers are holding their prices unchanged, but jobbers whose activities are not limited to consignment stocks owned by the mills, are continuing to shade prices. The resale market, in fact, is as unsettled here as at any time in months. Line pipe tonnage is negligible.

Two New Jersey and a Pennsylvania foundry are low on 2007 tons, 6 to 12-inch, cement-lined cast pipe, New York, bids June 2, department of purchase. While $54, delivered, was bid on part of the tonnage, prices averaged slightly better than $56 a ton. Pipe foundries also took the bulk of 193 tons of cement-lined fittings, underbidding jobbers who have been taking the bulk of fitting tonnage in the district. Low on part of this material was $73.90 a ton, delivered. Estimates are expected to be asked later this month on 8960 tons additional for New York city. Except for this opening, cast pipe and inquiry is light.

Birmingham, Ala. — Pipe plants, particularly those in the immediate district, are turning out some miscellaneous business such as sugar refinery equipment, but are short on orders from utilities. Operations, however, are better than generally anticipated.

Seattle — Cast iron goods are moving slowly, sales being confined to small lots. Many municipal improvements are awaiting allocation of federal funds. Wallowa, Oreg., has applied for a $13,600 WPA allotment, planning 8000 feet of main line and 6000 feet of 4 and 6-inch pipe. Bend, Oreg., has applied to WPA for $18,000 to improve its water system.

Cast Pipe Placed

1900 tons, 4 to 12-inch, East Bay municipal utility district, Oakland, Calif., as follows: 400 tons, 8-inch, to American Cast Iron Pipe Co., Birmingham, Ala.; 1500 tons, 4, 6, 10 and 12-inch to United States Pipe & Foundry Co., Burlington, N. J.

1100 tons, 4, 6, 12, 18 and 24-inch, water distribution project, Cuyahoga Falls, O., to J. B. Clow & Sons Co., Cleveland.

800 tons, 10-inch, pipe line between Palo Alto and Moffett Field, Calif., to United States Pipe & Foundry Co., Burlington, N. J.

150 tons, 18-inch, Redding, Calif., to United States Pipe & Foundry Co., Burlington, N. J.

100 tons, 6 and 8-inch pipe Burbank, Calif., to United States Pipe & Foundry Co., Burlington, N. J.

100 tons, 6-inch for Spokane, Wash., to Hughes & Co., Spokane.

Steel Pipe Placed

270 tons, miscellaneous pipe and fittings, bureau of reclamation, Denver, specification 1047, to D. R. Hardesty Mfg. Co.

195 tons, pipe, dam, Greybull, Wyo., to the Thompson Mfg. Co., Denver.

100 tons or more, 18-inch i. d. steel pontoon and shore pipe, U. S. engineer, Memphis, Tenn., to New York Central Iron Works, Hagerstown, Md., $14,984.60, delivered Bridge Junction, Ark., bids schedule 241.

Cast Pipe Pending

2007 tons, 6 to 12-inch, cement-lined, New York; United States Pipe & Foundry Co., Burlington, N. J., low on 982 tons; R. D. Wood & Co., Florence, N. J., 539 tons, and Donaldson Iron Works, Emaus, Pa., 486 tons. Bids June 2 to department of purchase.

1650 tons, 2 to 18-inch, Redding, Calif.; bids June 15.

100 tons, 20-inch, Burbank, Calif.

100 tons, 6 to 8-inch, Ferry Point park, New York, Triborough Bridge project; bids in.

Steel Pipe Pending

Unstated tonnage, 30 sections, 24-inch i. d. discharge pipe; 35 sections, 24-inch i. d. shore pipe, and 125 sections, 20-inch i. d. shore pipe, U. S. engineer, Louisville, Ky., schedule 450; bids in.

Wire

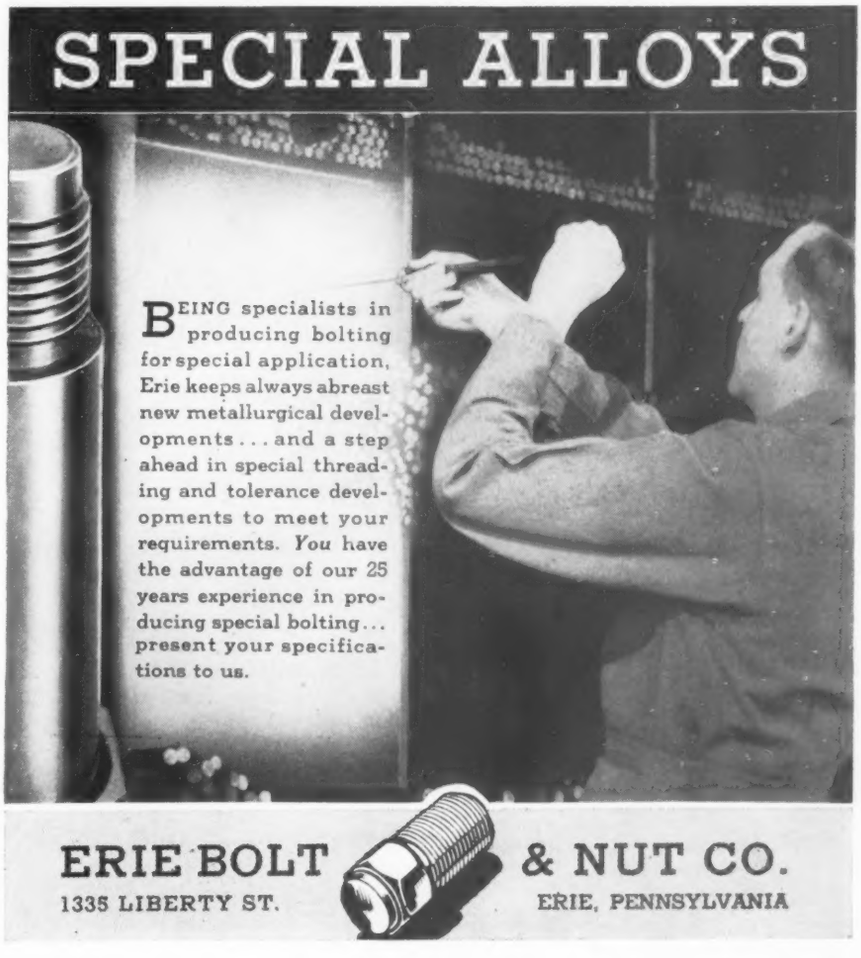
Wire Prices, Page 79

Pittsburgh—Sales for May in the manufacturers' wire division were somewhat better than for April. However, this was offset by the drop in demand for merchant wire products and the total tonnage was somewhat less. No improvement for the summer months can be seen.

Cleveland — Specifications for manufacturers' wire continue to reflect the low operating schedules among nut and bolt manufacturers and other users. No material improvement is anticipated during June. Needs from agricultural sources continue to bolster current requirements for merchant wire items although a seasonal easing in demand is under way.

Chicago—May sales showed some improvement over those of April and were substantially the same as a year ago. Farm equipment and automotive needs have continued to decrease. Increased construction work involving concrete is looked for but has not yet materialized. General demand remains quiet.

Boston—Dullness marks wire buying, practically all products being affected by a slight decline noted in finishing operations in most mills. The larger consuming industries are purchasing small lots only and incoming volume is made up almost entirely of scattered orders for prompt delivery, individual tonnages being light. Prices are gen-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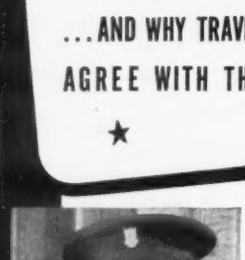

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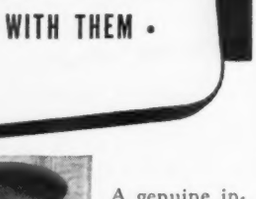

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erally steady and subject to little pressure, although reaffirming of quotations for third quarter has apparently had no effect on new business. Advance buying is absent.

New York — Wire buying has settled into a routine, incoming orders being small, for prompt shipment for fill-in needs. Demand for most products is slack, although wire rope buying is about maintained. Merchant goods have slowed down materially and manufacturers wire moves slowly. Spring material is restricted by absence of automobile buying and the unsettled copper market has retarded business in electrical wire and cable. Production has started on wire strand for the Bronx-Whitestone bridge cable at Trenton, N. J.

Rails, Cars

Track Material Prices, Page 79

Placing of 6014 freight cars by domestic lines in May brought the total to the highest since a year ago April, when 9773 cars were placed. The total last month, however, involved only two awards, 5550 cars for the Southern railway and 464 cars which the Milwaukee is having constructed in its own shops along with 55 passenger cars.

The May total brought domestic freight car bookings for the first five months to 6843, against 45,530 in the corresponding period last year, 22,909 in the first five months of 1936 and 1182 in the same period of 1935.

	1938	1937	1936	1935
Jan.	25	17,806	2,050	24
Feb.	109	4,972	6,900	806
March....	680	8,155	632	0
April.....	15	9,772	4,427	350
May.....	6,014	4,732	8,900	2
5 mos....	6,843	45,530	22,909	1,182
June	.....	548	5,200	5,151
July	.....	1,030	7,229	500
Aug.	.....	1,475	225	200
Sept.	.....	1,216	1,750	875
Oct.	.....	1,355	2,210	1,250
Nov.	.....	275	1,550	100
Dec.	.....	275	23,450	10,050
Total .	.....	51,611	64,643	19,308

Only a few scattered inquiries are active and with railroad outlook unsettled, pending negotiations over wage rates, most carbuilders see little ahead over the next several weeks. Included in the few new inquiries are thirty 40-ton box cars for American Smelting & Refining Co., for Mexico.

Car Orders Placed

Missouri & North Arkansas, two passenger-baggage cars, to American Car & Foundry Co., New York.

Locomotives Placed

Boston & Maine, 35-ton, gasoline-mechanical locomotive of 250 horsepower, to Plymouth Locomotive Works, Plymouth, O.

Rail Orders Placed

Municipal railway, San Francisco, 275 tons 110-pound rails, to Bethlehem Steel Co., Bethlehem, Pa.

Car Orders Pending

American Smelting & Refining Co., thirty 40-ton box cars for service in Mexico.

Cornwall Railroad Co., seven 70-ton hopper cars, inquiry revived.

Missouri Pacific, 100 flat cars contemplated for construction in its own shops, beginning late in the summer, following repair of 300 fifty-ton box cars.

New York board of transportation, 11 supply cars; bids soon.

Locomotives Pending

Chief of army engineers, Washington, 35-ton gasoline-mechanical locomotive or a diesel-mechanical locomotive for the Raritan, N. J., arsenal; bids June 7.

New All-Room Trains

(*Concluded from Page* 19)

the full length lockers and iceboxes are faced with aluminum. In the New York Central's Mercury, put into service between Cleveland and Detroit several years ago, stainless steel was used throughout.

Pullman cars contain no berths. Each room is air conditioned. By day, disappearing wall beds change the bedrooms into comfortable lounges, and walls can be folded away to convert two bedrooms into one living room for group accommodations. The roomette is a self-contained private bedroom, occupying slightly more space than a standard Pullman section.

Suppliers of high tensile steel, stainless steel and certain steel specialties include Carnegie-Illinois Steel Corp., the Armco Railroad Sales Co., Youngstown Sheet & Tube Co., Allegheny Steel Co. and Pyramid Metal Co. Truck castings were supplied by the General Steel Castings Corp.; truck springs by the American Steel Foundries and the American Locomotive Co.; roller bearings by the Timken Roller Bearing Co., and S. K. F. Industries Inc.

The Pennsylvania's new fleet includes eight trains, four in each direction. They will be the new Broadway Limited and the General, between New York, Philadelphia and Chicago; the new Liberty Limited, between Washington, Baltimore and Chicago; and the new Spirit of St. Louis, between the seaboard and St. Louis. It is planned to inaugurate all eight trains simultaneously on June 15.

Shapes

Structural Shape Prices, Page 78

New York — Contract will probably be placed this week for 6500 tons, Manhattan land section, Queens mid-town tunnel. Awards include 1650 tons for a Bridge approach, New York, but most are generally much smaller. Projects taking from 100 to 300 tons are slightly more numerous and new work covers 2500 tons for a tunnel ventilation building and a Bayonne, N. J., transit shed, bids on the latter closing June 9 on the steel work direct.

Pittsburgh — New projects are somewhat more numerous although no large tonnages are involved, with only two of more than 1000 tons appearing. The outlook is not promising and private construction continues to lag, with publicly financed projects supporting the market.

Cleveland—Structural awards have failed to respond to third quarter price announcement. Most projects for which contracts were awarded recently have not exceeded 50 tons. However, Bethlehem Steel Co., Bethlehem, Pa., is reported to have booked 200 tons for a bottling plant for the Coca-Cola Bottling Co. at Toledo, O. Bids went in last Friday for a Coshocton county, O., state bridge involving 188 tons. Projects which are still in the preliminary stages include 1200 tons for Timken technical high school at Canton, O., and the cloverleaf development near Brecksville, O., involving 1337 tons of structural and 558 tons of reinforcing bars.

Chicago — A fair amount of inquiries is again noted this week. Plant for American Steel Foundries, Hammond, Ind., calls for 650 tons. A 500-ton inquiry is out for an exhibition hall on Municipal pier, Chicago. Numerous other inquiries involve smaller tonnages. Vierling Steel Works will furnish 200 tons for a coal structure for Koppers Co., Royalton, Ill.

Boston — Including small bridges, an engine shop and miscellaneous construction, mostly public work, structural steel active aggregates less than 3000 tons. Vermont closes June 10 on small bridges taking 152 tons. Maine bridge requirements approximate 250 tons, all small. Numerous large construction projects are being considered under the federal spending program, but only a few have appeared for actual estimates.

Philadelphia — McCloskey & Co., Philadelphia, is low on the general contract for the printing plant job at Washington, taking 8800 tons of shapes. Architects are working on plans for a $1,000,000 apartment building but actual steel requirements may not come out for some time. Considerable interest is evidenced in a 10,000-ton bridge over the Raritan river in Middlesex county, New Jersey, due to come out early in 1939.

San Francisco — The only structural award exceeding 100 tons was secured by Bethlehem Steel Co. and involved 900 tons of sheet piling for the United States Engineer office, Los Angeles. Moore Drydock Co. are low bidders on 280 tons for a fair building on Yerba Buena Island, San Francisco. Awards aggregated 1728 tons and brought the total for the year to 46,554 tons compared with 98,845 tons in 1937.

Seattle — New projects are developing slowly, shops have backlogs generally cleared up and the immediate outlook is not promising. Week's largest award went to Pacific Car & Foundry Co., Seattle, 1000 tons involved in eight closure gates for Consolidated builders Inc., Coulee dam. Arthur J. O'Leary & Son, Chicago, is low at $83,000 on 1160 tons to reclamation bureau, Denver, for stop log guides at Coulee. Same office will receive tenders June 14 for bulkhead gate liners and anchor rods for nine main and three service station units, Coulee dam, Spec. 1075-D, tonnages unstated.

Shape Awards Compared

	Tons
Week ended June 4	**10,657**
Week ended May 28	**6,550**
Week ended May 21	**9,110**
This week, 1937	**32,915**
Weekly average, year, 1937	**16,060**
Weekly average, 1938	**15,061**
Weekly average, May	**8,963**
Total to date, 1937	**605,963**
Total to date, 1938	**346,397**

Includes awards of 100 tons or more.

Shape Contracts Placed

1700 tons, piling bulkhead, Bowery Bay, Queens, N. Y., to Carnegie-Illinois Steel Corp.; through J. Rich Steers Inc., New York, general contractor.

1650 tons, approach, George Washington Bridge, New York, to Bethlehem Steel Co., Bethlehem, Pa.; Walter Kidde Constructors Inc., New York, general contractor.

1000 tons, eight closure gates for Consolidated Builders, Inc., Coulee dam, Wash., to Pacific Car & Foundry Co., Seattle.

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900 tons, addition to Soldiers field stadium, Chicago, to Bethlehem Steel Co., Bethlehem, Pa.; through Lundoff Bicknell Co., Cleveland.

900 tons, sheet piling, United States Engineer office, proposal 541, Los Angeles, to Bethlehem Steel Co., Bethlehem, Pa.

450 tons, 1,000,000-gallon elevated steel tank, (including 140 tons of plates), town of Lake, Milwaukee county, Wisconsin, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

345 tons, central grade and high school, Cuba, N. Y., to R. S. McManus Steel Construction Co., Buffalo; L. C. Whitford Co., Wellsville, N. Y., general contractor.

325 tons, tunnel ribs, dam, Tionesta creek, Pa., to Commercial Shearing & Stamping Co., Youngstown, O.; S. J. Groves & Sons, Minneapolis, Minn., general contractor.

320 tons, seaplane hangar, administration building, North Beach, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; bids June 2 direct on steel fabricated and delivered only.

300 tons, bridge FAP 543E, Ontagamie county, Wisconsin, to Lakeside Bridge & Steel Co, Milwaukee.

295 tons, building, Long Island Lighting Co., Mineola, N. Y., to Ingalls Iron Works, Birmingham; through Andrew Weston & Co. Inc., Woodmere, L. I.

270 tons, state highway bridges No. 1 and 2, RC-2520, Pine City, N. Y., to American Bridge Co., Pittsburgh.

225 tons, state bridge over Pond river, Greenville, Ky., to Midland Structural Steel Co., Cicero, Ill.

200 tons, state bridge over Ute creek, Farley, N. Mex., to Des Moines Steel Co., Des Moines, Iowa.

185 tons, bridge repairs, Devon, Conn., to Berlin Construction Co. Inc., Berlin, Conn.

185 tons, addition, power house, Fremont, Nebr., to Fremont Foundry & Machine Co., Fremont, Nebr.

175 tons, central grade and high school, Rushville, N. Y., to Ernst Iron Works, Inc., Buffalo, N. Y.

170 tons, state bridge over Baltimore & Ohio railroad, Singerly, Md., to Bethlehem Steel Co., Bethlehem, Pa.

135 tons, hospital and nurses' home, Provo, Utah, to Provo Foundry & Machine Co., Provo.

130 tons, three service buildings, navy yard, Mare Island, Calif., to Judson-Pacific Co., San Francisco.

130 tons, Y. M. C. A. building, Carney's Point, N. J., to Bethlehem Fabricators Inc. Bethlehem, Pa.

115 tons, two transfer bridges, St. Ignace and Mackinaw City, Mich., for state, to Lackawanna Steel Construction Corp., Buffalo.

115 tons, distilled spirits building, World's fair, N. Y., to Jones & Laughlin Steel Service Corp., Long Island City.

115 tons, Baird street bridge, Green Bay, Wis., to Wisconsin Bridge & Iron Co., Milwaukee.

112 tons, building, Beechnut Packing Co., World's fair, New York, to Bethlehem Fabricators Inc., New York; through Fred T. Ley & Co., New York.

110 tons, bridge WPGM 2668, Toccoa, Ga., to Nashville Bridge Co., Nashville, Tenn.

100 tons, bridge, Narraguagus river, Millbridge, Me., to Bethlehem Steel Co., Bethlehem, Pa.; bids May 25.

Unstated tonnage, structural steel for intake gate rail support towers, Chickamauga dam, Tennessee valley authority, Knoxville, to Johnson City Foundry & Machine Co., Johnson City, Tenn., $43,312, f.o.b. Chickamauga dam. req. 94239.

Shape Contracts Pending

8800 tons, government printing office annex building 3, Washington; McCloskey & Co., Philadelphia, low on general contract, base bid of $4,291,000, excluding elevators, May 27. George A. Fuller Co., New York, second, $4,319,000.

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3000 tons, two land plane hangars B, North Beach, N. Y., for New York procurement division treasury department.

1400 tons, Manhattan ventilation building, Queens mid-town tunnel, New York; bids June 21, New York City tunnel authority.

1300 tons, repair shop and annex, Boston Elevated railway, Everett, Mass.

1060 tons, stop log guides, Coulee dam; Arthur J. O'Leary & Son, Chicago, low.

1000 tons, superstructure, transit shed, Bayonne, N. J.; bids June 9 with city engineer, Marcel Garsaud, on steel work direct.

1000 tons, highway bridge, Oklahoma City, Ottinger Bros., Hinton, Okla., low.

800 tons, Little Rock, Ark., municipal auditorium; Wm. Peterson Construction Co., Little Rock, low.

700 tons, plant buildings, American Steel Foundries, Hammond, Ind.

550 tons, addition Hahnemann hospital, Philadelphia, bids in.

500 tons, land plane hangar, administration building, North Beach, N. Y.

425 tons, state bridge over Hampton creek, Hampton, Va.

415 tons, state bridge FA-146-A, Cygne, Kans.

370 tons, state hospital buildings 5 and 6, Marlboro, N. J.

340 tons, bridges, Soddy Creek, Sale Creek and Opossum Creek, Hamilton county, Tenn.; bids June 20, Tennessee valley authority, Knoxville, Tenn.; work also takes 75 tons of reinforcing steel.

278 tons, Charles Edwin Fox memorial, Philadelphia, bids in.

270 tons, battery plant, Thos. A. Edison, Inc., Bloomfield, N. J.

260 tons, auditorium, Connecticut College for Women, New London, Conn.

250 tons, head frame and conveyor house, Glen Alden Coal Co., Ashley, Pa.

250 tons, supports for grandstand, Ebensburg, Pa., U. S. treasury department.

250 tons, office building addition, Massachusetts Protective Association, Inc., Worcester, Mass.; general contract bids in.

225 tons, galvanized structural steel for Chickamauga and Guntersville switchyards; bids June 20, Tennessee valley authority, Knoxville, Tenn.

200 tons, plate girder bridge, FAP-368, Osage, Iowa.

164 tons, junior fair building, for the city of Columbus, O.; bids taken June 3.

130 tons, bridges over Polecat and Big Spring creeks, Tennessee valley authority, Guntersville, Ala.

130 tons, shapes and bars, post office, Janesville, Wis.; J. P. Cullen & Son, Janesville, low.

120 tons, Clerk street bridge, Jersey City, N. J.; bids of June 1 rejected.

115 tons, highway work, Pitkin county, Colorado; bids opened.

150 tons, store building, Ashland, Ky., general contract to Frank Messer & Sons, Cincinnati.

Unstated, bulkhead gate liners, anchor rods, Coulee dam; bids to bureau of reclamation, Denver, June 14; Spec. 1075-D.

Unstated, 125-foot bridge, Bonner county, Idaho; bids to bureau of roads, Ogden, Utah, June 10.

Unstated, seven span state bridge, Shelby, Mont.; W. P. Roscoe Co., Billings, low.

Unstated, five aerial towers, etc., for Spokane, Wash. facility; Charles Dahlgren, Seattle, general contractor.

Reinforcing

Reinforcing Bar Prices, Page 79

New York — Reinforcing bar buying has declined but small-lot demand remains well sustained. New inquiry is light. Bids close for approach foundations, Lincoln tunnel, North Bergen, N. J., June 7, taking 290 tons. The larger contracts are for highway mesh, several more hundred tons being placed for New York state roads with better than 1000 tons included in projects bid, but not yet placed.

Pittsburgh — The price situation is weak in a number of sections. In the southwestern states and the mid-west certain producers have notified the trade they will supply both new billet and rail bars at a decrease of $5 a ton. This is an extension of the price which has been in general effect in Texas. Contracts placed over the past week are extremely small and new contracts reported are almost negligible.

Cleveland — Reinforcing bar requirements in northern Ohio for which estimates were requested during May totaled 744 tons, a slight decline from 748 tons in April. The May figure was bolstered by two sewer projects for Akron, O. Estimated tonnage of joists was only 67 tons compared with 127 tons for April. Fabricated prices are generally weak on the small tonnages awarded recently.

Chicago — Market for reinforcing bars was dormant this week with no awards reported. Prices remain weak. May sales were about on a par with April, however, indications are that there will be some improvement this month. Inquiries have been small but there is an anticipation of an increase shortly. Award has not yet been made for completion of Soldier Field stadium.

Boston — Highway mesh for Connecticut leads reinforcing steel purchases, several hundred tons being placed with new inquiry amounting to 250 tons closing June 14 at Hartford. Small-lot buying for bridges and miscellaneous needs is more active, but projects taking more than 100 tons each are few. Prices tend to be steadier on current light volume, but shading appears for the larger lots.

Philadelphia — McCloskey & Co., Philadelphia, is low bidder on the general contract for plant addition, bureau of printing and engraving, Washington, requiring 2540 tons of reinforcing bars. A number of small repair and addition jobs are noted but the aggregate tonnage is not large.

San Francisco — Of outstanding interest was the opening of bids on 1669 tons for the United States Indian Irrigation Service, Los Angeles. Awards were all confined to lots less than 100 tons. New inquiries on private work continue to come forth slowly. Awards totaled only 560 tons, bringing the aggregate to date to 41,534 tons, compared with 38,253 tons a year ago.

Seattle — Pending business is of small proportions and no important projects are up for figures. Inquiry from industrial sources is unimportant. Business pending includes 440 tons for the Pullman, Wash., overpass, bids in.

Reinforcing Steel Awards

450 tons, mesh and bars, highway, Hamden and Norwalk-Westport, Conn., to Truscon Steel Co., Youngstown, O.; and American Steel & Wire Co., Cleveland; through New Haven Roads Construction Co., New Haven, two contracts; bids May 9 at Hartford.

181 tons, 7-story state capitol annex building, Denver, Colo., to Denver Builders' Supply Co., Denver; F. J. Kirchof Construction Co., Denver, general contractor.

165 tons, highway mesh, Monroe and Niagara counties, New York, to Bethlehem Steel Co., Bethlehem, Pa.

144 tons, Delano school for Crippled Children, Kansas City, Mo., to Ceco Steel Products Corp., Omaha, Nebr.; S. Patti Construction Co. Inc., Kansas City, general contractor. Kansas City Structural Steel Co. awarded structural steel.

137 tons, Roza reclamation project, Washington state, to unstated interest.

125 tons, bridge, Blue Ridge parkway, Patrick county, Virginia, to Virginia Steel Co., Richmond, Va.

103 tons, unit 1, Fulton fish market, New York, to Igoe Bros., Newark, N. J.; through A. J. Paretta Co., New York.

100 tons, navy requisition 5036-38, Philadelphia, to W. Ames & Co., Jersey City, N. J., on May 23 bids.

100 tons, sewage disposal plant, Bucyrus, O., to Pollak Steel Co., Cincinnati.

100 tons, faculty building, Catholic university, Washington, to Rosslyn Steel & Cement Co., Washington.

100 tons, highway mesh, Steuben county, New York, to Wickwire-Spencer Steel Co., New York.

Unstated, Parco, Wyo., reclamation

Concrete Bars Compared

	Tons
Week ended June 4.....	1,705
Week ended May 28	5,609
Week ended May 21	7,204
This week, 1937	7,493
Weekly average, year, 1937	6,266
Weekly average, 1938.....	5,598
Weekly average, May.....	5,872
Total to date, 1937	114,399
Total to date, 1938	128,740

Includes awards of 100 tons or more.

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MOORE RAPID
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for
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Alloy and Carbon Steels.
Gray and Malleable Irons.
Copper, Nickel and Alloys.
Ferro-Alloys, Carbide.
Special Products.

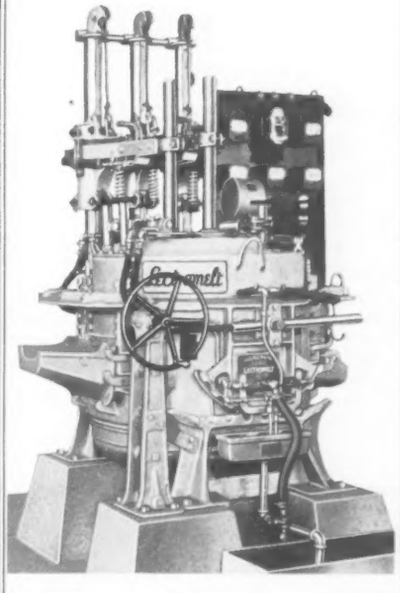

Illustration shows recent 500 pound capacity 3 phase direct arc LECTROMELT furnace installed in Southern jobbing steel foundry.

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25 LBS. TO 50 TONS CAPACITY

PITTSBURGH
LECTROMELT
FURNACE
CORP.
PITTSBURGH, PA.

project, to Colorado Fuel & Iron Co., Denver.

Reinforcing Steel Pending

2450 tons, government printing office annex building 3, Washington; McCloskey & Co., Philadelphia, low on general contract on base bid of $4,291,000, excluding elevators, May 27.

1669 tons, United States Indian irrigation service, Los Angeles; bids opened.

1500 tons, sewer, avenue T and Flatbush avenue, Brooklyn, N. Y.; bids June 8.

280 tons, auxiliary prison, Jefferson City, Mo.; E. C. Childers Construction Co., Jefferson City, Mo., low.

250 tons, Little Rock, Ark., municipal auditorium; Wm. Peterson Construction Co., Little Rock, low.

250 tons, water reservoir, Pittsburg and Clarksville, N. H.

225 tons, Timken technical high school, Canton, O.

145 tons, bureau of reclamation, invitation A-22,349-A, Mills, Wyo.; bids opened.

135 tons, mesh, highway 8150 feet, Whitney avenue to Eatons Brook, Hamden, Conn.; bids June 14, William J. Cox, state highway commissioner, Hartford; FAP No. 1-F.

130 tons, two bridges, Calaveras county, California, for state; bids opened.

120 tons, bridge in Yuba county, California, for state; bids June 15.

117 tons, bureau of reclamation, invitation A-22,353-A, Mills, Wyo.; bids opened.

115 tons, mesh, highway 6750 feet, Whitney avenue, Hamden, Conn.; bids June 14, William J. Cox, state highway commissioner, Hartford; FAP No. 1-E.

104 tons, bureau of reclamation, invitation 28,064-A, Glendive, Mont.; bids opened.

100 tons, A. M. Scaife residence, near Ligonier, Pa.

100 tons, for Catholic church, Fort Mitchell, Ky.; bids in.

Pig Iron

Pig Iron Prices, Page 80

Pittsburgh — Pig iron price situation remains unchanged, with only isolated evidences of shading. Present quarterly prices have been extended in practically all districts for third-quarter deliveries. Tonnages being released are spotty and only an occasional car is moving.

Cleveland — Opening of books for third quarter has failed to stimulate demand. Some sellers expect June sales and shipments to show a moderate decline with the outlook from automotive foundries notably pessimistic. Requirements from other melters are substantially unchanged, with buying on a hand to mouth basis.

Chicago — May shipments were off about 30 per cent from those of April. Foundry operations are particularly spotty. Many operate on but a two-day a week schedule, some making automotive castings having been down all week. Stocks of iron are reported low; about 30 days' supply is believed an average for foundries.

Boston — Despite an unimproved low rate of foundry operations, pig iron demand has been slightly better since the first of the month, bolstered by a 500-ton sale recently. Consumer stocks are low and the moderate flurry is attributed to this. Larger consumers continue to draw on inventories for bulk of current needs which are small. For brackets and angles, the Watertown, Mass., arsenal has bids on 109,400 pounds, class 2 steel castings.

New York — June has started off slowly in pig iron. Most sellers see little ahead for the next several weeks, with the larger buyers, who still have fair stocks on hand from last year, showing little or no interest and with the smaller buyers, who have virtually no stocks, buying on a strictly hand-to-mouth basis.

Last month brought a slight improvement in specifications for some producers, but a decline in new orders for most. This latter is accounted for in part by a further reduction in export buying. A pick-up in demand from the Orient, notably Japan, is expected within 30 days.

Philadelphia — A soil pipe maker has placed orders for several hundred tons of pig iron, unusual in the present market. Consumers which ordinarily buy in lots of two and three hundred tons currently are taking no more than a 5-ton truck load or about enough for a single heat. Foundry operations range from 10 to 60 per cent.

Buffalo — Pig iron production has fallen to about 20 per cent of capacity. Producers found shipments for May on par with the previous two months. Foundries continue to buy in restricted volume for current needs only.

Cincinnati—Pig iron shipments in June show a receding tendency, which may be a post-holiday phenomenon. Foundries average about two heats a week, with a few exceptions on heavier schedules.

St. Louis—A few scattered small lots for prompt shipment constitute the extent of buying of pig iron. Aggregate of such sales during the past ten days or two weeks is the smallest for any similar period since last summer. Shipments have also tapered and indications point to no expansion during the next few weeks. The melt has also receded slightly, but not as greatly as new purchasing and shipments.

Stove foundries are running two to three days per week, but most are busy on stock for fall and winter distribution, new business placed being in very small volume.

Birmingham, Ala.—Pig iron production continues on a reduced scale and with considerable stock on yards. Prospects, however, are that Republic will relight its Thomas stack the first of next week.

Toronto, Ont. — Merchant pig iron sales are showing gradual improvement with indications third quarter sales will show higher records than those for the first six months. Melters continue to take iron as demands dictate, but repeat

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orders are appearing at more frequent intervals and orders are running to better tonnage than formerly. Individual orders range from a car to 500 tons with sales for the week totaling around 2000 tons. Six blast furnaces are blowing with output 65 per cent of all Canadian capacity. Prices are firm and unchanged.

Scrap

Scrap Prices, Page 82

Philadelphia — A substantial tonnage of No. 1 heavy melting steel has been sold at $11.50, delivered nearby mill, representing a new low in the present movement. The market structure has not been weakened appreciably by the revelation of a sale at a lower figure, since the previous range of $12 to $12.50 had been substantiated by actual business and brokers still are paying $11.50 for material against contracts. Yard stocks are low and dealers are not anxious to dispose of accumulated material. One mill has just issued releases after a holdup of several weeks.

No. 2 steel continues to move on the basis of $9.50 to $10. Machine shop turnings have sold at both $6 and $6.50. Cast scrap shows a slightly firmer tendency with business done at $12.50. Steel specialties are unchanged.

Pittsburgh — The market continues weak, with prices moving downward again after a temporary leveling off. Recently closed railroad lists sold for less and affected sympthetically almost the entire list. Mills in this district have been taking No. 1 scrap at $11 and are understood to be offering $10.50. The state of the export market has also had its effect on depressing prices here.

Cleveland—Bids being offered for compressed sheet scrap are having the result of sustaining prices for this material. Other grades, however, are slow in moving into consumption, especially lighter grades. Quotations have not changed in the present listless markets. Railroad offerings are comparatively small.

Chicago — Extreme quiet characterizes the market. Heavy melting steel is down to a range of $10 to $10.50. Rails for rolling are especially scarce here. No mill sales have been recorded for several weeks and brokers see no prospect of demand for some time. Railroads have offered only small quantities and some have withdrawn their offerings from sale.

Boston — With possible business with Pennsylvania mills dimmed by low delivered prices and high freights, what little volume being done in iron and steel scrap is with district foundry consumers, steel works taking little tonnage. Prices on most grades for New England delivery are sharply reduced. Appearance of some distress material on which minor business has been done has lowered prices on some grades from $2 to $3 a ton, delivered.

New York — Iron and steel scrap buying continues inactive, steel works taking little material from this district, and shipments of foundry grades are limited to a few scattered car lots. Specialty grades are also dull. While still negotiating with the European cartel, sellers have not closed definitely on additional tonnage and former orders are practically exhausted. European consumers are unwilling to pay prices based on current low quotations for dock or barge delivery, most brokers offering $8.50 barge, but not pressing for tonnage.

Buffalo — The leading consumer of the district has slashed 50 cents a ton more from its bid price on steelmaking scrap. A bid of $10.50 a ton prevails on No. 1 heavy melting steel, but the range of $10.50 to $11 was left intact as dealers thus far have refused to sell at the lower price. A small sale also was reported to another source around the outside figure.

The chief buyer dropped the bid after receiving approximately 4500 tons of scrap, made up of various grades figured at the customary differentials, on the basis of $11 a ton for No. 1 stock.

Detroit—Reports of higher prices on recent automotive lists are not given much credence locally, consensus of opinion being that sales were at current levels. Meanwhile the market is drifting aimlessly.

Cincinnati—Activity has virtually disappeared from the scrap iron and steel market. Mills have no interest in further purchases and the near outlook for expanding steelmaking is not bright. Dealers and brokers have taken a sideline position with only occasional dealings in which quotations, nominally unchanged, appear soft.

St. Louis—Dealers are finding no trouble in covering recent commitments of heavy melting steel, involved in the purchase of 10,000 tons by a district mill. Prices here are relatively somewhat higher than elsewhere, which has caused heavier shipments from country dealers and freer offerings by railroads. However thus far all incoming scrap has been absorbed readily.

Birmingham, Ala.—Scrap remains unactive, marked by sagging prices. Buying is scattered and in small lots.

Toronto, Ont.—Trading in iron and steel scrap is beginning to show improvement, but demand continues specialized, although the active list is expanding. Local dealers are making shipments of heavy melting steel to Hamilton mills as supplies are available, and odd-lot shipments of turnings and flashings

● Heat- and corrosion-resistant alloys for heat treating, carburizing, normalizing.

● Cyanide or liquid salt pots, lead pots, furnace conveyors, trays, racks.

● Spiral retorts, quenching fixtures, retorts, muffles, etc.

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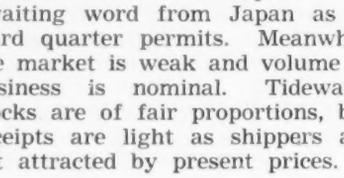
are reported. Foundries and electric furnace operators are in the market for cast scrap and dealers report demand in excess of supplies. Stove plate also has good call with stocks light.

Seattle—The present movement of scrap to Japan consists of only occasional small lots. Exporters are awaiting word from Japan as to third quarter permits. Meanwhile the market is weak and volume of business is nominal. Tidewater stocks are of fair proportions, but receipts are light as shippers are not attracted by present prices.



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Single from $2.50
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GARAGE IN CONNECTION

Warehouse

Warehouse Prices, Page 81

Pittsburgh — Warehouse interests here report tonnages sold in May slightly less than those of April, with little or no interest shown in the market and the price situation firm in view of small business.

Cleveland — Warehouse distributors note little change in average day to day shipments out of stock. Customers continue to order only for actual needs and for prompt delivery. Inventories among most consumers are relatively low but until operations register substantial improvement hand to mouth buying will persist. A new price schedule is expected to be announced soon. Some distributors expect a net reduction in a number of flat-rolled steel items.

Chicago—May volume was on a par with April, although a seasonal decrease had been expected. Leveling off in demand is expected during summer. Activity in the various commodities has not differed appreciably, no one item being reported unusually active. Prices are steady.

New York — Warehouses have reduced cold-rolled strip and flat wire 10 cents per 100 pounds following mill price revisions. Demand is unchanged at about the late May rate. May volume was slightly under April. Orders are fairly numerous, but tonnage per shipment is generally small, although demand as to products is well diversified.

Philadelphia—Steel business out of warehouse in May showed a slight increase over April, according to some interests, while others reported a moderate decline. It is believed average business for the entire trade showed little change. Business last week was adversely affected by the holiday and a moderate lift is expected during the present week. Jobbers here continue to study revised extras on sheets and strip but will not issue new price lists until mill galvanized sheet schedule has been carefully analyzed.

Buffalo — While warehouse sales for May were approximately the same as April, an expected tapering off in demand is noted during the opening days of June. No price changes have been made so far, but some downward adjustment is anticipated in sheets and strip.

Cincinnati—June opened with a decided bulge in ordering from warehouses but there is no assurance that it will hold. Mill declarations on third quarter prices may have brought the turn, inventories of consumers being depleted. Inquiries on government-financed jobs requiring small tonnages of reinforcing bars are more numerous.

St. Louis—Distributors of steel from store report May volume slightly below April, and the smallest for the month since 1932. Outlet through the general manufacturing trade, which showed little response to the usual spring influences, has narrowed still more.

Seattle—Business continues spotty, May's volume about equaling April but much below levels of a year ago. No item is outstanding, sales being almost entirely out of stock as mill buying is only occasional. In view of unchanged mill prices for third quarter, jobbing houses plan no revision of price schedules. However, prices of sheets may be adjusted in line with mill practice, placing hot-rolled and light sheets on the same basis.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 79

Recent reaffirmation of prices for third quarter created little more than a ripple in bolt and nut buying. Extension of prices was in line with previous trade expectations; hence, there was relatively little delay in the placing of necessary tonnage prior to the opening of books for next period. Buying is decidedly spotty.

Ferroalloys

Ferroalloy Prices, Page 80

Pittsburgh—Orders and inquiries for ferroalloys in this district are practically absent. Immediate shipment on all orders now being placed is an indication that there are no high inventories at any point. Tonnage will be directly dependent on the production rate in the steel industry.

New York — Within a week sellers of ferromanganese are expected to open books for third quarter and the general trade expectation is there will be no change in price. Similar action is also expected on other leading ferroalloys.

Ferromanganese shipments have shown little variation since March, when the best movement for the year to date was witnessed. With steelmaking operations showing a more pronounced downward tendency, ferromanganese shipments this month are likely to drop, but leading sellers assert that at least another week or so should be permitted to elapse before making any firm predictions.

The market is $102.50, duty paid, Atlantic and Gulf ports. Domestic

spiegeleisen is unchanged, at $33, Palmerton, Pa., for 19 to 21 per cent material and $39 for 26 to 28 per cent.

Ferrotungsten, which has been showing the greatest fluctuation of all principal alloys over recent weeks, is holding nominally unchanged with too little business to test the market.

Nonferrous Metals

New York — Price sentiment strengthened in all major nonferrous metal markets last week on several favorable developments, including announcements on further curtailment in copper production in this country, a reduction in tin quotas for the third quarter, the acceptance of the buffer pool plan by the International Tin committee, and indirectly the slight upward trend in security values in Wall street.

Copper — Kennecott Copper Corp. will close its American mines almost completely for a period of at least one month while other large producers have previously announced sharp curtailments. This action will improve the statistical position of the industry. Export copper advanced steadily, closing at 8.50c to 8.55c, c.i.f. European ports. Electrolytic held unchanged here at 9.00c, Connecticut, in a quiet market.

Lead — Sales exceeded expectations daily with the total for the week estimated at 6000 tons. Prices held at 4.00c, New York, 3.85c, East St. Louis.

Zinc — Sellers continued to restrict business for future delivery while buyers showed little interest in nearby positions. Prices held at 4.00c, East St. Louis, for prime western.

Tin — The International committee fixed the quota for the third quarter at 45 per cent of standard tonnages which were increased 7½ per cent in the case of Malaya and Netherlands East Indies. A portion of this quota will be allocated later towards the formation of a buffer stock. Details of the plan are expected to be announced on July 1. Prices moved sharply higher in London while Straits spot here advanced to 38.60c from the previous week's close of around 36.00c. Buying in the domestic market was somewhat more active.

Sinclair Lets Tank Work

Sinclair Refining Co., New York, has awarded two contracts to Koppers Co., western gas division, Fort Wayne, Ind., for its refinery at East Chicago, Ind. The work includes a weld-caulked, water-sealed gas holder of 750,000 cubic feet capacity, a sweating tank 18 x 25 feet, three open-top rundown tanks 8 x 10 x 26 feet and two hot water tanks 8 feet 6 inches square and 12 feet high. The tanks will be of welded steel.

Nonferrous Metal Prices

Spot unless otherwise specified. Cents per pound

	Copper			Straits Tin, New York							
May	Electro, del. Conn.	Lake, del. Midwest	Casting, refinery	Spot	Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
28	9.00	9.12½	8.52½	36.20	36.30	4.00	3.85	4.00	20.00	12.00	35.00
30—Holiday.											
31	9.00	9.12½	8.52½	36.75	36.85	4.00	3.85	4.00	20.00	11.75	35.00
June											
1	9.00	9.12½	8.52½	37.50	37.65	4.00	3.85	4.00	20.00	11.75	35.00
2	9.00	9.12½	8.52½	38.70	38.90	4.00	3.85	4.00	20.00	11.75	35.00
3	9.00	9.12½	8.52½	38.60	38.75	4.00	3.85	4.00	20.00	11.75	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 9.00c Conn. copper

Sheets

Yellow brass (high) 15.62½
Copper, hot rolled 17.12½
*Lead, cut to jobbers 7.25
Zinc, 100-lb. base 9.75

Tubes

High, yellow brass 18.37½
Seamless copper 17.62½

Rods

High yellow brass 11.62½
Copper, hot rolled 13.62½

Anodes

Copper, untrimmed 14.37½

Wire

Yellow brass (high) 15.87½

OLD METALS

Nom. Del. buying prices

No. 1 Composition Red Brass

*New York 4.50-4.75
*Cleveland 5.00-5.25
Chicago 4.50-4.75
*St. Louis 4.75-5.00

Heavy Copper and Wire

*New York, No. 1 ..... 6.25-6.50
*Cleveland, No. 1 ..... 6.00-6.25
Chicago, No. 1 ..... 6.00-6.25
*St. Louis 6.25-6.50

Composition Brass Borings

*New York 3.75-4.00

Light Copper

*New York 4.60-4.62½
*Cleveland 4.50-4.75
Chicago 4.25-4.50
St. Louis 4.25-4.50

Light Brass

*Cleveland 2.75-3.00
*Chicago 2.50-2.75
St. Louis 2.50-2.75

Lead

*New York 3.50-3.62½
Cleveland 2.75-3.00
Chicago 2.75-3.00
*St. Louis 2.62½-2.87½

Zinc

New York 1.75-1.87½
Cleveland 1.50-1.75
*St. Louis 1.50-1.75

Aluminum

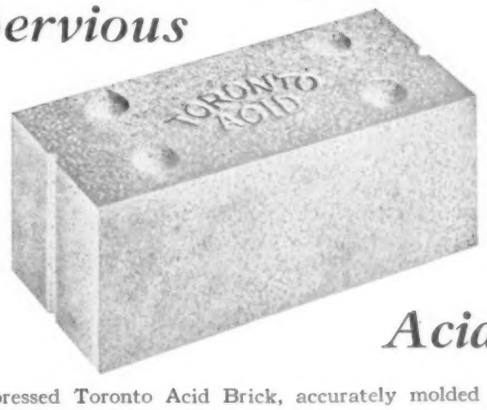
*Borings, Cleveland 4.00-4.25
*Mixed, cast, Cleveland 6.00-6.25
*Clips, soft, Cleveland 11.50-11.75
*Mixed cast, St. Louis 6.50-7.00

SECONDARY METALS

Brass ingot, 85-5-5-5, less carloads ... 9.25
*Standard No. 12, aluminum ... 14.00-14.50

TORONTO **ACID BRICK**

Impervious



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THE KEAGLER BRICK CO.

Steubenville, Ohio (Pittsburgh District)

Iron Ore

Iron Ore Prices, Page 82

Cleveland — Shipments of iron ore from the upper lakes during May totaled 1,180,703 tons compared with 10,043,856 tons in the same month last year. This represents a decrease of 88.24 per cent. Shipments for the season to June 1 with the comparable figures a year ago follow:

Port	To June 1, 1938	To June 1, 1937
Escanaba	81,873	858,238
Marquette	37,523	1,211,323
Ashland	96,150	1,087,482
Superior	666,138	4,576,485
Duluth	251,936	3,776,857
Two Harbors	307,597	2,304,026
Total	1,441,217	13,814,411

New York—While Chinese wolframite is still holding nominally at around $17, duty paid, certain elements of strength indicated recently are lacking. The somewhat firmer prices quoted over the past fortnight not only by importers but domestic producers have failed to bring out tonnage and within the past few days rather sharp concessions have been made by some domestic interests, who apparently are anxious to liquidate stocks for cash. However, consumers still have ample stocks on hand and in several important consuming lines the outlook still is badly beclouded. Under these conditions not even present concessions appear to be stimulating buying.

While the trade in general does not look for a return of the low prices of 1932 when imported tonnage averaged around $10.50, duty paid, and domestic ore at $9.20, according to figures compiled in some trade quarters, the fact that the present market is still well above these low figures, causes buyers to move slowly, particularly in view of the depressed outlook in business.

Foreign iron ore prices continue nominally unchanged. There is little or no domestic buying, but there is still a sufficient amount of European buying, apparently, to bolster foreign ore prices. This is particularly true, it is said, with respect to low phosphorus ore.

Another factor in this relative steadiness of prices is the recognition of importers that buyers in this country, having substantial stocks on hand, and being confronted with continued dull prospects, are not in the mood to buy except possibly at very sharp concessions which sellers do not care to make.

This is true with respect to manganese ore, as well as iron ore.

Equipment

New York—Machine tool purchases lag, retooling and expansion programs being deferred in most instances. Orders for one or two machines at a time drift in. Few units remain to be shipped against last year's heavy purchases. Export demand is lighter. Dealers canvassing the Detroit area feel machinery buying for new models will be sharply restricted. At the moment inquiry for government shop needs commands more attention. For the navy, Washington delivery, Rockford Machine Tool Co., Rockford, Ill., is low on a shaper at $10,816. For Philadelphia a list including several machines, bid May 20, involves an engine lathe, Boyle & Emmes Machine Tool Co., Cincinnati, low; precision lathe, Monarch Machine Tool Co., Sydney, O.; W. E. Shipley Machinery Co., Philadelphia, is low on a horizontal boring, drilling and milling machine at $21,716, bid May 24. For the Frankford, Pa., arsenal, Federal Machinery Sales Co. is low on a vertical boring mill at $28,927. Contracts for motor air compressors and spares for the Brooklyn and Philadelphia yard shops went to Ingersoll-Rand Co., $117,472; Hardie-Tynes Mfg. Co., $84,278 and Sullivan Machinery Co., $12,602.90.

Boston—Domestic orders for machine tools have dwindled to a few scattered purchases. Export buying has also declined of late, although some New England shops still have volume to be shipped warranting operations at 30 hours a week. On the whole, however, shop schedules tend downward. Airplane engine builders are well booked and operating near capacity. While most of these shops are well tooled, additional foreign business which might result in increased productive capacity, would result in some buying. Bearing producers, hit by the lack of automobile orders, are slack, although some are stocking various sizes for industrial needs. Cleveland Automatic Machine Co., Cleveland, is low on four automatic screw machines for the Newport, R. I., navy shops while Heald Machine Co., Worcester, at $11,025, is low on an internal grinder for Philadelphia.

Cleveland — Domestic machine tool and equipment business continues dull, but is leveling out on a more even keel. Several sizable orders which were figured some months ago have been released in the past ten days. Westinghouse Electric & Mfg. Co. recently released several tools and has inquiries out for a 30-inch lathe and a 14-inch lathe with auxiliary equipment. Most dealers report May business on par or slightly under that of April, although a few noted a slight increase. Export demand has waned recently although builders still have sizable backlogs.

Seattle—Demand for machinery and equipment is lower, inquiry coming mostly from public works sources. Electrical equipment, pumping units and road machinery items lead. WPA projects are calling for small lots of tools and equipment.

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Construction and Enterprise

Ohio

AMHERST, O.—Village of South Amherst, Henry Garland, mayor, has retained C. J. Simon & Associates, Van Wert, O., to make a survey for proposed waterworks system. Cost about $60,000.

CLEVELAND — City, division of streets, City hall, is taking bids until noon, June 10, order 338-38, for eight gasoline compressors.

DAYTON, O. — War department, air corps, materiel division, office of contracting officer, Wright Field, will take bids until 10 a.m., June 20, for one crawler-type full revolving crane, equipped with crane boom with ½ yard clam shell rehandling and light digging bucket, Northwest model 18 or equal.

NEWPORT, O.—Stillwater Clay Products Co. plans boiler house in connection with rebuilding of three-story sewer pipe manufacturing plant.

PAINESVILLE, O. — City, C. S. Fullerton, city manager, is taking bids until noon, June 10, for erection of light plant building and addition to turbine building; also complete erection of 15-ton, hand power, overhead crane in new addition to turbine room.

TIPPECANOE, O.—Contracts will be placed soon for equipment for expansion of municipal power plant, including steam turbine driven exciter, generator air cooler, and forced draft cooling tower. Walter I. Barrows, Reibold building, Dayton, O., consulting engineer.

WOOSTER, O. — City, William Long, mayor, is taking bids due June 14 for erection of sewage treatment plant, estimated cost of which is $170,000. James Fox is city engineer.

Michigan

L'ANSE, MICH. — Peninsula Tractor Co. has been organized by Homer A. DeRocher to distribute road building and maintenance machinery, logging and snow removal equipment.

LANSING, MICH.—Contract will soon be awarded for six-story superstructure for addition to municipal light and power plant, including extensions in central steam-heating department. Cost about $2,750,000 with equipment. Claude Erickson is engineer.

SAGINAW, MICH. — City will build a refrigeration plant and system in proposed municipal market building. Cost estimated over $500,000.

Connecticut

WATERBURY, CONN. — Eastern Color & Printing Co., 61 Leavenworth street, plans boiler plant for heating service in new one-story plant. Leo F. Caproni, 1221 Chapel street, New Haven, Conn., architect.

Pennsylvania

AMBRIDGE, PA. — Ambridge borough, S. L. Card, secretary, is taking bids due 7 p.m., June 13, for two electric motor-driven centrifugal pumps to boost water.

Indiana

KENDALLVILLE, IND. — Board of public works will award contract soon for three horizontal, centrifugal, nonclogging sewage pumps, with capacity of 200, 300 and 500 gallons per minute; air blower and auxiliary equipment for municipal sewage plants. Fund of $90,000 has been arranged. Charles Hurd, Architects and Builders building, Indianapolis, consulting engineer.

WABASH, IND. — Northern Indiana Power Co., Indianapolis, plans extensions and improvements in primary and secondary lines at Wabash and vicinity. Transformers, switchgears and accessory equipment will be installed. Cost close to $150,000.

Illinois

ST. CHARLES, ILL. — Bids will soon be taken for power plant for two-story city hall building. Cost over $125,000. Harold R. Zook, 140 South Dearborn street, Chicago, architect.

Alabama

MONTGOMERY, ALA. — Construction service, veterans administration, plans power house at new hospital on Atlanta highway near here. Pumping station and other utilities will be installed. Cost $1,000,000.

MUSCLE SHOALS, ALA. — Muscle Shoals Shoe Mfg. Co. plans boiler house at new shoe manufacturing plant, 200 x 400 feet. A power substation will also be built. Cost $85,000.

Maryland

BALTIMORE—Crown Cork & Seal Co. has filed plans for extensions in boiler house at metal cap manufacturing plant. Lucius R. White Jr., 10 West Chase street, is architect.

District of Columbia

WASHINGTON — Bureau of supplies and accounts, navy department, will take bids until 10 a.m., June 10, schedule 3605, reducing valves; until June 17, schedule 3602, one motor-driven, universal duplex vertical miller-shaper, delivery San Diego, Calif.; schedule 3613, motor-driven grinders and spare parts; schedule 3620, propeller and stern tube steel shafts, delivery Mare Island, Calif.; schedule 3629, aluminum and aluminum alloy tubing; schedule 3653, main reduction gears and spare parts, delivery Brooklyn, N. Y., and Philadelphia; schedule 3665, lighting distribution panels, delivery Brooklyn, N. Y.; until June 14, schedule 3616, one motor-driven metal cutting hack saw, delivery Brooklyn, N. Y.; schedule 3625, oxyacetylene torches, delivery Brooklyn, N. Y.; schedule 3626, universal test indicators, delivery Washington, D. C., and Sewall's Point, Va.; until June 21, schedule 3632, steel, bar, plate, shapes and sheets; schedule 3667, four tons nickel-chromium alloy rod, delivery Mare Island, Calif.

Kentucky

FRANKFORT, KY. — State department of welfare will soon begin construction of power plant at new state prison buildings at LaGrange. Cost $800,000. Ralph C. Wyatt, Frankfort, engineer.

LEXINGTON, KY.—Lexington Water Co. plans steam turbines, generators, motor turbine pumping machinery, filtration apparatus, purification machinery and other equipment in connection with expansion in waterworks stations. Cost $200,000.

TOMPKINSVILLE, KY. — Surveys and estimates of cost are being made for a municipal electric distributing system, including power substation facilities, and transmission line. Patrick Sullivan is engineer.

Tennessee

CHATTANOOGA, TENN. — Electric power board receives bids June 21 for 44 KV substations, Nos. 3 and 6, steel structures, electrical equipment, auxiliary equipment, feeder and control cables, oil circuit breaker and transformer placement; PWA project.

Louisiana

NAPOLEONVILLE, LA. — Supreme Sugar Refinery will place contracts soon for boiler units, pumps, conveyors, generator and accessories for power house at cane-sugar mill in connection with rebuilding plant recently destroyed by fire. Leo S. Weil and Walter B. Moses,

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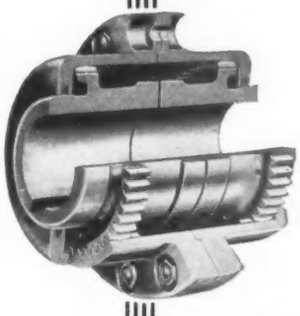

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425 Peters street, New Orleans, are engineers.

SHREVEPORT, LA.—Shreveport Charity hospital plans new ice manufacturing and refrigerating plant at institution, for which fund of $38,000 is being arranged.

West Virginia

HUNTINGTON, W. VA.—United States engineer office is preparing plans for purchase of $100,000 worth of supplies and equipment to be used in connection with construction of projected Huntington and Kenova flood walls. Equipment required includes power shovel, dump trucks, elevating graders and modern earth moving machinery, lumber, safety equipment, wire, pipe, nails, etc.

Missouri

APPLETON, MO. — City, R. W. Becraft, mayor, is preparing plans for construction of an impounding reservoir, purification plant and extension of water mains at a cost of $60,000. J. W. Shikles & Co., 708 New York Life building, Kansas City, Mo., consulting engineer.

CARROLLTON, MO. — City, Oscar Brunsworth, city clerk, contemplates erection of municipal power plant costing $235,000. Burns & McDonnell Engineering Co., Kansas City, Mo., consulting engineer, has submitted a report. A new municipal waterworks plant, costing $165,000, is also contemplated.

HUMANSVILLE, MO. — City, W. E. Bodine, mayor, is preparing plans for the construction of a new water tank, purification plant and extension of water mains at a cost of about $40,000. Plans are also being prepared for new sewage disposal plant at cost of $50,000. J. W. Shikles & Co., Kansas City, Mo., consulting engineer.

SPRINGFIELD, MO. — City, Harry Durst, mayor, will submit two plans to PWA, one for construction of a new waterworks plant and the other for remodeling and repairing present plant. Cost of a new plant is about $6,500,000.

Wisconsin

BLOOMER, WIS.—Wisconsin Refrigerated Lockers Inc. plans new one-story cold storage plant. Cost $30,000 with equipment.

CUDAHY, WIS. — Vocational school board is applying for PWA grant for erection of $35,000 addition to manual training institute, directed by Ray L. Gruber.

FOND DU LAC, WIS. — Ben Sadoff, president, Wells Mfg. Co., maker of ignition coils and other electrical automotive parts, has purchased American Motor Products Co., New York, maker of replacement ignition parts, and is transferring production and office to Fond Du Lac.

GREEN BAY, WIS.—Northern Paper Mills Inc. has placed contract with Baker Construction Co., Green Bay, for erection of new steam-electric generating plant at mill. Work will begin at once. Estimated cost with equipment $750,000. Sargent & Lundy Inc., Chicago, consulting engineer.

LA CROSSE, WIS. — Vocational school board has plans by Boyum, Schubert & Sorenson, architects, as basis for application for PWA grant to build addition. J. B. Coleman is director.

MANITOWOC, WIS. — Heresite & Chemical Co., maker of molding powders, plastics, synthetic resins, etc., has purchased the Mertz knitting mill plant on South Fourteenth street, occupied for some time under lease, and will modernize and make alterations. Considerable new machinery will be installed. Charles H. Hempel is president.

MILWAUKEE — Nunn, Bush & Weldon Shoe Co., 2820 North Fifth street, will start work shortly on $50,000 addition to private generating plant. H. L. Nunn is president.

RICHLAND CENTER, WIS. — City has been authorized by state public service commission to add 1250-kilowatt steam turbine to present generating equipment, instead of 2500-kilowatt unit requested. Cost estimated at $83,000.

SUPERIOR, WIS. — Superior plans municipal ice manufacturing and cold storage plant. Cost about $100,000 with equipment.

Minnesota

HALSTAD, MINN. — Village, A. P. Opgrand, clerk, will hold a special election soon to vote on construction of a municipal light plant and distribution system, costing $40,000. Ealy G. Briggs, 1957 University avenue, St. Paul, consulting engineer.

LAKE PARK, MINN. — WPA has approved a project for erection of a sewage disposal system costing $85,000. Victor H. Wahl is village clerk.

MINNEAPOLIS — City, Fred T. Paul, city engineer, will select a site and then issue $158,000 bonds to finance construction of a garbage incinerator building and installation of new equipment.

MINNEAPOLIS — Brede Inc., manufacturer of signs and display equipment, plans construction of a two-story manufacturing plant to cost $100,000. D. J. C. Parsons, Foshay tower, is architect.

MINNEAPOLIS — Northern States Power Co., Robert F. Pack, president, plans improvements to Riverside steam plant, including installation of a new 35,000-kilowatt generator, with auxiliary equipment and two boilers.

ST. PAUL—Snow Mover Corp., 1691 Marshall avenue, has been organized to manufacture all types of snow plows by George Niess, C. H. Janesen and J. S. Locketz.

SLAYTON, MINN. — Otto Meaden has started construction of a one-story machine shop, 36 x 50 feet.

STEPHEN, MINN. — Village, J. F. Yetter, village clerk, is contemplating complete water and sewage treatment plants costing about $70,000 and will apply for federal aid. P. C. Bettenburg Inc., 1437 Marshall avenue, St. Paul, consulting engineer.

STILLWATER, MINN. — Muller Boat Co. plans construction of a two-story boat manufacturing plant, including shop and display room.

WINTHROP, MINN. — City, George Schemann, clerk, will have plans ready for bids soon on erection of a municipal heating plant and distribution system, including firebox boilers, automatic stokers, vacuum pumps, coal conveyors and meters, to cost $62,000. George Huelskamp is city engineer, and Rose & Harris, 416 Essex building, Minneapolis, are consulting engineers. (Noted April 18).

Texas

HOUSTON, TEX. — Continental Supply Co., Continental building, Dallas, Tex., manufacturer of oil well and other machinery, plans installation of motors and controls, conveyors, power substation apparatus, electric hoists and other equipment in new plant. Cost $800,000. (Noted May 16).

HOUSTON, TEX.—Tennison Mfg. Co., 1901 Franklin street, has acquired three buildings and 8¼ acres of land on Houston Ship Channel west of Lockwood Bridge, and will probably transfer operations from Franklin street to new location. Joseph Finger, architect, National Standard building, is preparing plans for proposed office building and the other three buildings will be remodeled.

PORT ARTHUR, TEX. — Wilson & Bennett Mfg. Co., 6532 South Menard avenue, Chicago, will build a steel con-

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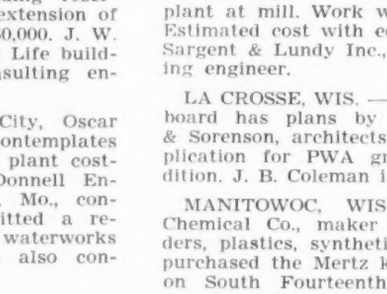

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tainer manufacturing plant here, and will install machinery for making containers from one-gallon size to 54-gallon steel drums.

Kansas

KANSAS CITY, KANS. — Board of public utilities, Charles A. Lowder, secretary, is preparing plans for the installation of a new 25,000,000-gallon per day steam driven pump and construction of a pump house at the Quindaro plant to cost about $250,000. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., consulting engineers.

North Dakota

FARGO, N. DAK. — Menasha Wooden Ware Corp. has awarded contract to Meinecke & Johnson Co. for construction of a one-story factory, 40 x 110 feet.

FARGO, N. DAK. — Northern States Power Co. will soon start $810,000 improvement program to Fargo plant, including new addition, 50 x 175 feet, to cost $610,000, to house new equipment capable of increasing power capacity by 50 per cent. New Equipment will include a 5000-kilowatt generator and boilers. J. F. McGuire is general manager.

Nebraska

ALLIANCE, NEBR. — City, Clarence H. Hoper, city manager, is awaiting PWA grant of $144,000 to finance improvements at municipal power plant costing $319,650. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., consulting engineer.

CAMBRIDGE, NEBR. — United Public Power & Irrigation district, O. C. Shoemaker, president, is awaiting PWA grant of $459,000 and loan of $563,000 to finance construction including power plant and distribution system. Clark E. Mickey, 1915 D street, Lincoln, Nebr., consulting engineer.

COLUMBUS, NEBR. — Loup River Public Power district, Harold Kramer, secretary, is awaiting PWA grant of $2,335,000 and loan of $2,855,000 to finance purchase of power equipment costing $5,190,000.

FREMONT, NEBR. — City, Fred D. Drew, mayor, is awaiting PWA grant of $135,500 to finance improvements to municipal power plant costing $296,644. George Grabe, Fremont, is architect.

LEWELLEN, NEBR. — Blue Creek Public Power and Irrigation district, Roy M. Brown, president, is awaiting PWA grant of $297,000 and loan of $363,000 to finance construction of power plant, including transmission lines. Parson, Klapp, Brinkerhoff & Douglas, 142 Maiden Lane, New York, consulting engineers.

LINCOLN, NEBR. — City, Theodore H. Berg, city clerk, is awaiting PWA grant of $78,750 to finance improvements to municipal power plant costing $175,000. D. L. Erickson is city engineer.

SUTTON, NEBR. — City, Dr. J. M. Welch, mayor, is awaiting PWA grant of $45,000 to finance construction of sewage disposal plant costing $100,000. H. H. Henningsen Engineering Co., 326 Union State Bank building, Omaha, Nebr., consulting engineer.

Iowa

BURLINGTON, IOWA—Extensions in municipal steam heating plant and system, including new transmission pipe lines to several buildings are planned.

CEDAR RAPIDS, IOWA — LaPlant-Choate Mfg. Co., maker of road building machinery, snow plows, etc., plans construction of an addition to its factory to cost about $50,000.

CHEROKEE, IOWA — City, J. A. McDonald, mayor, contemplates construction of a sewage disposal plant costing $130,000 and will probably apply to PWA for funds.

DES MOINES, IOWA—Burdick & Howson, 20 North Wacker drive, Chicago, consulting engineer, has prepared plans for water softening plant for municipal waterworks, costing about $950,000.

FORT DODGE, IOWA — Tobin Packing Co. Inc. has awarded contract to W. A. Klinger Inc., Warnock building, Sioux City, Iowa, for construction of a three-story packing plant addition, 60 x 80 feet, to cost $60,000, not including equipment. H. P. Henschein, 59 East Van Buren street, Chicago, is architect.

INDEPENDENCE, IOWA — City will apply to PWA for a grant to aid in financing construction of a new sewage disposal plant costing $77,000. Green & Co., 417 First avenue, Cedar Rapids, Iowa, consulting engineer.

MT. PLEASANT, IOWA — J. P. Budde, city clerk, is taking bids until June 15 for a 1000-kilowatt turbogenerator unit with air filter, condenser, circulating pumps, air ejector, etc., for municipal light and power plant.

SPENCER, IOWA — Aer-Zephyr Corp. has been incorporated with capital stock of $50,000 to manufacture wind-driven electric power plants, by Wayne C. Carlson, Orville T. Eames and C. A. Birdzell.

SPENCER, IOWA — City has selected Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., to make a survey of waterworks and light plant to determine what improvements are necessary.

WATERLOO, IOWA — John Deere Tractor Co., L. A. Rowland, general manager, has awarded contract to E. W. Sproul Construction Co., 2001 West Pershing road, Chicago, for erection of a three-story factory addition, 100 x 140 feet.

Montana

SHELBY, MONT. — Producers' Refinery Co., recently incorporated with capital stock of $1,000,000, will soon start construction of an oil refining plant near here. Incorporators are D. M. Drumheller Jr., W. E. Burke and George H. Hutchins, all of Cut Bank, Mont.; James W. Johnson, G. C. Hoyt, H. M. Kluth, C. O. Bohn, of Shelby; O. A. Nepstad, Ferdig, Mont., and C. N. Wrighter, Kevin, Mont.

Pacific Coast

LOS ANGELES—Los Angeles water and power bureau, 207 South Broadway, has plans maturing and will take bids soon for new electrical equipment and repair shop. Cost estimated at $350,000, with equipment.

SAN FRANCISCO — Bureau of yards and docks, navy department, Washington, is preparing plans and will ask bids soon for new equipment storehouse at Mare Island navy yard, to include installation of motors, controls, conveyors, material handling apparatus and other equipment. Appropriation of $800,000 has been authorized.

PRINEVILLE, OREG.—Ochoco Lumber Co. plans boiler house at new lumber and woodworking mill. Cost about $100,000. F. Hill Hunter, engineer.

SEATTLE — City engineers have completed plans for proposed $325,000 sewage treatment plant. Project awaits PWA approval. Plans involve a large pumping unit.

SEATTLE — Rheinlander Brewery Inc. has been organized with capital of $125,000 by Emil G. Sick, president, Seattle Brewing & Malting Co. and others. The plant formerly operated by Apex Brewing Co. has been acquired and the company plans expenditure of $150,000 for remodeling and installing new equipment.

TACOMA, WASH. — City has appropriated $27,000 for construction of a 6000-kilovolt power substation.

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BEARINGS (Needle)
Torrington Co., The, Torrington, Conn.

BEARINGS (Oilless)
Rhoades, R. W., Metaline Co., 50 3rd St., Long Island City, N. Y.

BEARINGS (Quill)
Bantam Bearings Corp., South Bend, Ind.

BEARINGS (Radial)
Bantam Bearings Corp., South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
Hyatt Bearings Div., General Motors Corp., P. O. Box 476, Newark, N. J.
Shafer Bearing Corp., 35 E. Wacker Drive, Chicago, Ill.
SKF Industries, Inc., Front St. and Erie Ave., Philadelphia, Pa.
Timken Roller Bearing Co., Canton, O.

BEARINGS (Roll Neck)
Bantam Bearings Corp., South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
Hyatt Bearings Div., General Motors Corp., P. O. Box 476, Newark, N. J.

BEARINGS (Roll Neck)—Con.
National Bearing Metals Corp., 928 Shore Ave., Pittsburgh, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
SKF Industries, Inc., Front St. and Erie Ave., Philadelphia, Pa.
Timken Roller Bearing Co., Canton, O.

BEARINGS (Roller)
Bantam Bearings Corp., South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
Hyatt Bearings Div., General Motors Corp., P. O. Box 476, Newark, N. J.
Norma Hoffmann Bearings Corp., Stamford, Conn.
Shafer Bearing Corp., 35 E. Wacker Drive, Chicago, Ill.
SKF Industries, Inc., Front St. and Erie Ave., Philadelphia, Pa.
Timken Roller Bearing Co., The, Canton, O.